Pit and Quarry

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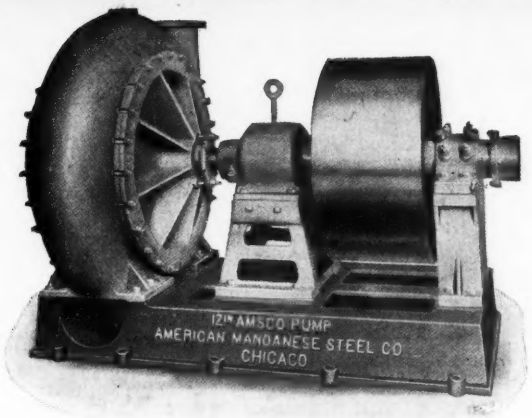
HANDLING • CRUSHING • SCREENING • WASHING



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APRIL, 1921

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The Valve Bag Company of America is known by its customers to put into its product the most conscientious careful workmanship, the results of many years manufacture of Valve Bags and the toughest, strongest paper-stock that money can buy.

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Pit and Quarry

Member Audit Bureau of Circulations
A Monthly Journal for Producers of Sand, Gravel, Stone, Cement, Gypsum and Lime

VOL. 5 CHICAGO, ILL. APRIL, 1921 NO. 7

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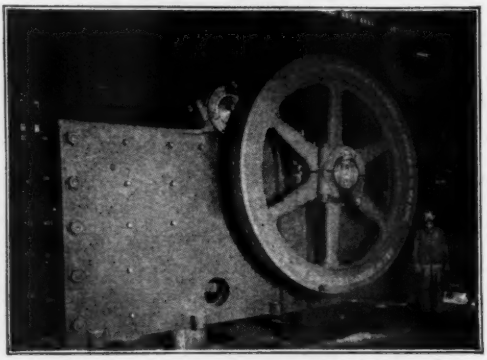

and that's not only a claim but a fact. **All** our crushers, no matter whether they are of the "Panel" or "Box" side frame types, are built throughout of the best quality, thoroughly annealed, heat treated, open hearth steel, which combined with the infinite care of Buchanan design and construction accounts for the great length of life and high crushing efficiency of

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Pit and Quarry

Vol. 5 Chicago, Ill., April, 1921 No. 7

Time for every piece of equipment to be in active operation.

Blasting Gravel Banks

MANY gravel banks are easy to excavate, for the mixed sand and gravel may run like sugar as it is dug, but in other cases the sand and gravel is cemented together, so that the digging is expensive.

When this is the case, the bank should be shot up by means of explosives so that the excavating can be done quicker and cheaper. Large and heavy blasts may not be necessary, but instead such blasting as will loosen and shake the gravel so the excavating machine can dig at a low cost.

If the excavation is attacked from on top, then the gravel bank should be shot with shallow holes, a number in a series. The holes can be from a few feet to about 6 feet in depth and placed as far apart as once or twice their depth. This kind of blasting will make a number of pot holes and give the ground the appearance of "No Man's Land," but scrapers and drag lines will soon shape it up. When excavation is made to the depth of the holes, a new series are driven and blasted. This can be done over an extensive area, shooting from 20 to 100 holes at one time. A bank can be excavated to any depth in this manner.

If the excavation is made against the breast of the bank, then make holes the depth of the breast and spaced at such a distance as to equal from one-half to the full depth of the holes. For this kind of shooting the holes should be sprung.

In shooting the series of shallow holes, dynamite should be used from 25 to 40 per cent strength according to how compactly the gravel may be packed. For springing the deep holes dynamite should likewise be used, but for the large blast in these holes Judson powder or some similar explosive should be used, as the effect will not be so shattering as with a higher explosive, nor will there be the same likelihood of throwing the bank down upon the excavating machinery.

Deep holes can be drilled with well drills, but it is sometimes necessary to case the holes so as to prevent gravel falling down in the hole and choking it up.

Cheap Valves Versus Good Valves

WHEN globe, check or some other kind of valves are needed in a pit or quarry, for either a steam, air or water line, the ordinary procedure is to order them from the nearest hardware supply house. They will send anything they have in stock, and if the buyer specifies the Blank Manufacturing Company's valve, the dealer will say "We don't knock their valves, but we have another make of valves that is just as good and won't cost you much more than half as much as the Blank valve."

It is to be regretted that most buyers will accept this kind of an excuse. All pipe fittings, valves, unions, etc., are most important. In water lines, it is at small leaks that freezing first starts, and leaks make wet spots that may cause accidents. On air lines, leaks and poor valves mean that pressures are reduced, while steam pipe leaks mean the waste of fuel, and escaping steam can cause serious accidents.

Valves and pipe fittings vary much in quality of material and vary exceedingly as to workmanship and finish. A cheaply made valve of poor materials means that it soon begins to go to pieces. The handle wheel may soon come off, or air holes may show up in the casting. On the poorer grades it only takes a little use to use up the seat of the valve and cheap unions last a shorter time than the valves.

The value of metal work and machinery, and valves and pipe fittings, cannot be gauged by their prices. It does not pay to buy cheap pipe fittings. Too much depends upon them and they are given hard constant use around sand and gravel plants, washing plants, and stone plants and stone crushers, so it does not pay to use them, for it costs more in labor to install them than it does good ones.

Any purchaser of pipe fittings should try out a number of makes of pipe fittings and when he has found valves that will stand up to his work, he should insist on buying that kind. Don't let someone, to make extra money from you, sell you something that may be inferior in quality. Well advertised goods must possess merit or they could not stand the test of such publicity. It costs to advertise and make good articles, and dealers should be taught that they must furnish customers the goods they desire if they wish to hold their business. In emergencies it may be necessary to take what one can get, but if a supply of fittings is on hand the kind that will prove to be cheapest in the end can always be used.

Start Drilling Early

IN APRIL many quarries in the northern section of the country are beginning to make preparations for starting their work. Thus this month is the period for starting the drilling of deep holes.

Well drillers can be overhauled after standing idle all winter and holes can be sunk in the ledge, and then plugged with large wooden plugs until it is desired to shoot them in the spring.

Thus ample holes can be drilled ahead so that the other work need not be held up, and with a large number of holes the most effective blasting can be done. This too is the time to dress up the toe of the ledge and get large boulders broken up.

Shooting Bottoms in a Quarry

IN visiting quarries during the past year, it has been quite surprising to see how frequently in many quarries small ledges projecting above the floor of the quarry are blasted with "adobe blasts."

A number of sticks of dynamite are placed upon the projecting ledge, plenty of mud placed upon them, and the blasts detonated. The common belief is that dynamite shoots down, thus making it possible to break up the ledge without drilling.

It is true that dynamite shoots down, but no more than it shoots up. The facts about the case are that it exerts the same pressure in all directions, but it does most of its work in rock blasting in the direction of least resistance. Thus a charge of dynamite exploded as an "adobe blast" on some hard bottom explodes more than half of its energy upon the mud and the air.

Thus 5 pounds of dynamite shot as an adobe actually wastes about 3 pounds of the charge. Two pounds placed in a hole would prove as effective, if not more so, than the 5 pounds on top.

With 40 per cent powder costing about 20 cents per pound, about 60 cents is wasted. In most cases about half this amount would pay for drilling the hole, and not only would money be saved, but the blast would be much more effective, enough so to prevent the necessity of a second or third blast.

Thus money, labor and time are saved by doing block hole blasting in taking up hard bottom instead of adobeing the points of the ledge. Quarrymen should remember that these things prevent such a waste of money. For drilling shallow holes the small hammer drills are both efficient and economical.

The Cost of Doing Without

TWO men of long experience in quarry operation and heavy construction work were discussing the quarrying of crushed stone and the plant needed for economical operation. One man said:

"I have seen the machine you mention. I believe it is a good one and thought of installing one until I secured a quotation, when I found the price prohibitive. If they want quarrymen to use such machines, the price should be reduced."

"Evidently" interrupted the other quarryman, "You have not learned the lesson I have, that the cost of buying plant equipment as compared to the *cost of doing without* can be insignificant. The latter can be the heaviest cost—the one that can bankrupt you and prevent your competing with others in this business. Yet it is the cost of a waste that you may never be able to locate until it is too late."

The lesson this man had learned is one that many business men are slow to realize. They believe so much in their own ability and in being able to accomplish things by makeshift machines and by hand methods. In some cases a man will say, "Oh, with a man or two I can do the same work that a machine will do."

This may be so, but the cost may be from 50 to 100 per cent higher.

Another man states that he is satisfied with his present equipment, that he has used it for years. In most cases this only denotes ignorance on his part. McAdam more than a century ago may have been satisfied with his method of breaking stone, for he used it all his life; yet today, if he were alive, he would certainly use a rock crusher.

During the last year the writer has seen much of quarrymen paying the cost of doing without various kinds of machines and apparatus. One operator on a very large depth of ledge was using tripod drills, another was using hammer drills. Both of these were bringing down rock by drilling short holes and blowing down a few tons at a time. Their costs for drilling and blasting must have been excessive as compared to what it would have been if well drill holes had been used. The savings of a few months alone would have been sufficient to have paid for the well drill.

On the other hand, a quarryman who was using a well driller was paying the high cost of not having a tripod drill. He owned several such drills, but was unwilling to use them. The result was that his ledge was not breasted up properly, and the toe had such a slope that a large hump was left in the quarry, being in the way of taking out and handling the large mass of rock broken loose by the blast. A few snake holes would have been worth several hundred dollars in this case.

It is surprising how many quarries lack the proper drilling equipment, for it seems since the days that hand drilling was the only method, that the selection of drills has been to follow the popular fancy. One time it was tripod drills, then well drills, and today it is hammer drills. In most quarries all of these drills should be used.

Many pit and quarry operators pay a great cost for doing without appliances in connection with their steam plants, this cost being excessive use of coal. A cost that occurs daily and at the end of a season has eaten up many dollars that would otherwise have been profits. Many of these appliances have been named before in special articles in PIT AND QUARRY, such as the use of dampers, contrivances to keep the tubes free from scale and soot, feed water heaters, improved grate bars, and those things that count in making a boiler efficient.

In a large number of quarries boulders must be broken up so as to be

loaded into cars, due to the fact that quarrymen are willing to pay the cost of doing without steam shovels. This cost is represented in a number of items, one of the largest being that by most methods, it is not possible to load and transport enough stone to the crushers to keep them going to their full capacity.

Small crushers instead of large ones may also mean an extra cost. These things show that there is such a thing as the cost of going without. The usual excuse is the lack of money to purchase the necessary machines. This may be a serious matter, but it is not insurmountable, for it is possible to effect economies that will save money, so that the purchases can be made from the earnings effected. Then, too, many things can be bought on lease sale agreement, so that it is possible to make the machines earn enough to help pay for themselves. There is an old saying, "Where there's a will, there's a way." And this is applicable, and will help solve many financial policies, and more especially that of curtailing the cost of doing without machines and tools that will cheapen production and add considerably to the season's profits.

Limiting Immigration

THE Dillingham Bill, limiting immigration to the United States for 15 months to three per cent of the number of each nationality in the United States, was killed through the exercise of the "pocket veto" by President Wilson. This bill, which in the closing days of the session was substituted by the Senate Committee on Immigration for the Johnson Bill and was passed by both houses of Congress, was referred to the President on February 28th.

The veto of this measure was urged by the Inter-racial Council in a brief submitted to the President on March 1st. The Council pointed out that the bill proposed a policy which would: (1) Close this country as an asylum for immigrants, (2) cause unlimited hardship to families who will be prevented from re-uniting and thus stimulate the return of our foreign born residents, (3) discriminate against certain nationalities and minority races, and (4) create international misunderstandings and arouse racial bitterness.

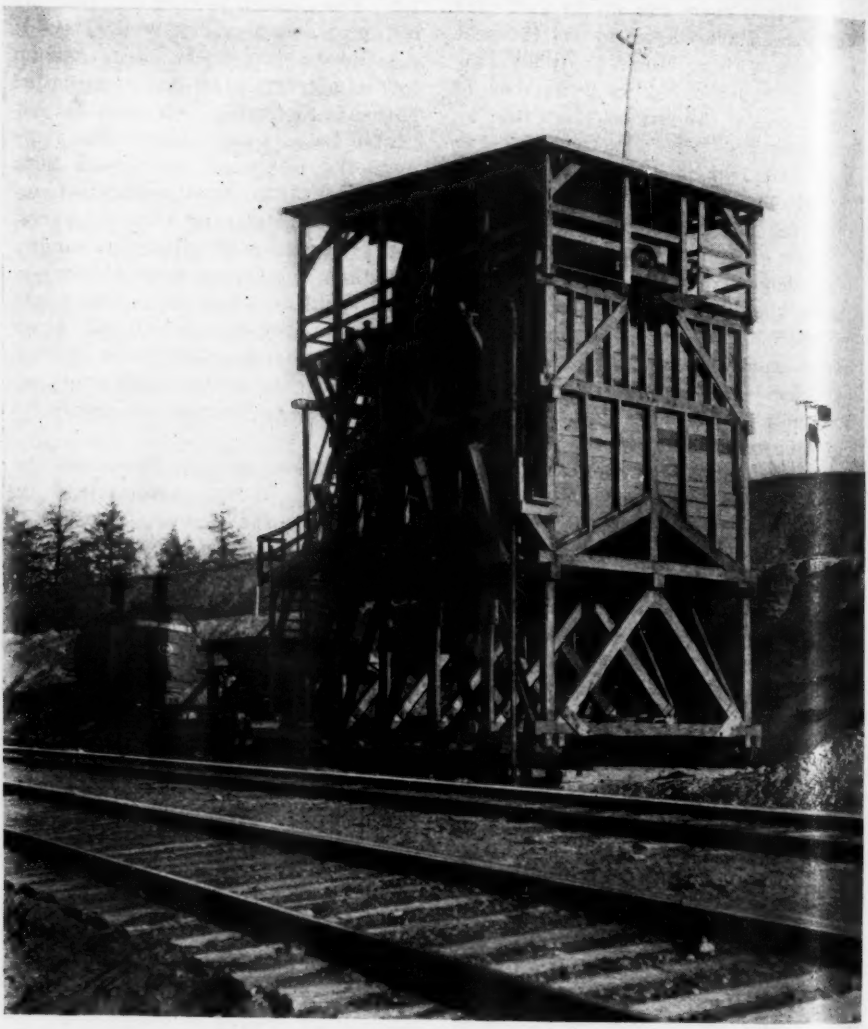
This bill or a similar measure will unquestionably be introduced again when the next special session of Congress convenes in April and every effort will again be made to secure its passage.

In its brief to the President the Inter-Racial Council summarized its objections to the measure as follows:

The general effects of this bill will be: To permit a very limited number of new aliens to enter the United States; to create considerable international misunderstandings because of apparent discriminations against certain nationality groups; to arouse opposition and bitterness among the races now resident in the United States who have received no official recognition as a "nationality" and who will have no definite assurance as to the number of their respective races that may enter, and to prevent the reunion of families of our alien residents.

This bill was passed to meet an alleged emergency which, after three weeks of public hearings, the Senate Committee on Immigration showed did not exist for the following reasons: (1) Foreign nations were enacting regulations to keep their emigrants at home where they are needed, (2) steamship carrying capacity is limited to a total of 800,000 during the year, (3) Quarantine laws are sufficient to prevent the spread of disease which no percentage test can affect, and (4) existing laws are adequate if enforced.

The Henry Steers Sand & Gravel Company, 17 Battery Place, New York, one of the leading concerns in the industry in this section, has been merged with its affiliated organization, known as Henry Steers, Inc. The business will be conducted along the same lines as heretofore.



This Plant on Wheels

Crawford Sand and Gravel Company Has Unusual Plant

In June, 1920, the Crawford Sand and Gravel Co., Inc., was organized and incorporated at Meadville, Pa. The bank is located on the main line of the Erie R. R. near Saegertown, Pa. It is a river deposit presumably made by a pre-glacial stream and, on account of its close proximity to the railroad and to water, its high percentage of sand (75% passing the ¼-in. screen), and small percentage of silt and loam it will be a very profitable deposit to work. As shown in the accompanying photograph the most of the sand and gravel lies above the level of the railroad and so close to it that it was necessary to remove about three thousand yards of the material in order to make room for the screening and washing plant.

The plant was designed and built by the owners; the machinery being furnished by the Beckwith Machinery Co. of Pittsburgh, a Telsmith 42-inch washer and screen being used. The bins have a total capacity of one hundred tons and are built on wheels, making it possible to move them along the bank and thus save a second handling of the sand. This is a most ingenious idea, and one which, we believe, is new to most of our readers. It is not, of course, adaptable to many plants; but where it is possible, it seems that it would be a wonderfully efficient proposition to simply move your plant, instead of being forced to handle the sand a second time.

The excavating is done with an Osgood 12-ton locomotive crane equipped with a Byers 1¼-yard clamshell bucket.

The material is discharged by the crane into the hopper, shown at the left of the photograph, and is fed automatically to the elevator which conveys it to the washer and screens above. French creek, located just across the Erie tracks, furnishes an inexhaustible water supply and a convenient outlet for the waste water.

Electric power is used throughout except on the crane. One 15 h. p. motor supplies the motive force to operate the elevator and screens and another 40 h. p. motor runs the pump.

The sand has passed the Pennsylvania State Highway Specifications for both quality and gradation and, as many miles of new concrete roads are contemplated for the northwestern part of this state, the business for the next few years will consist almost exclusively of this kind of work.

The Texas Stone Products Company, Dallas, Tex., has been incorporated with $22,000. Incorporators are J. N. Ivy, Fred Webb and F. P. Warren.

Prospects for Car Supply

Excerpt from Bulletin of National Association of Sand and Gravel Producers.

The controlling factors of the car situation, are labor conditions and fuel supply—and they are in themselves so uncertain that no trustworthy prediction can be offered as to what the open top car situation will be for this year.

It is estimated that there are 350,000 open top cars lying idle at present. An unusually large percentage of these cars are on their home lines, which is a more favorable aspect of the situation, as relocation of cars will not be necessary.

In testifying before the Senate committee on manufacturers on Jan. 18th, Chairman Clark of the Interstate Commerce Commission made the following statement: "The acute car shortage of last year may again be experienced unless a means is devised to bring about the transportation of coal in advance of seasonable requirements."

Coal is already moving to the lake ports and is being loaded, ready to go to the Northwest as soon as lake transportation is resumed. There are, however, vast amounts of coal left over from last season's shipments to that section of the country, and this fact will not help to stimulate early purchases.

Optimism should prevail for the effect it may have in encouraging construction work, but it is only good business to keep in mind when working your contracts this season, that interruptions to your operations may be expected so long as the Interstate Commerce Commission retains its power to grant preferential car supply.

Stone Leaves Illinois

Resigns as Association Secretary to Manage Company in Indiana

MR. BEN STONE, for many years secretary of the Illinois Concrete Aggregate Association, has resigned that office, effective April 1, 1921, and will take over the management of the Merom Sand and Gravel Company, of Merom, Ind., with offices in Indianapolis.

It is largely owing to Mr. Stone's efforts and diplomacy that the recent amalgamation of the Sand and Gravel, and the Crushed Stone Associations was effected.

Mr. Stone's departure will be a severe loss to the association, as he worked tirelessly to further the interests of the association and of the industry. His many friends wish him all success in his new work.

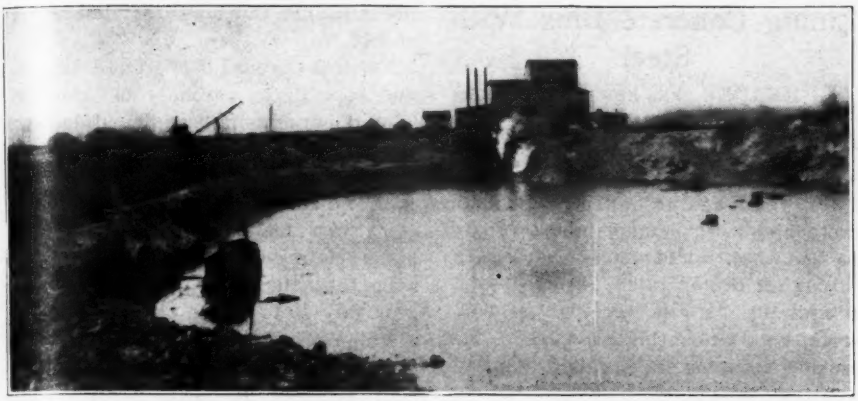
Disposing of Flood Water

ONE of the large Indiana quarries, when preparing to start operations this spring, was confronted with a flooded pit, and the first thing to be done was to drain it. For this purpose, two pumps were installed, a concrete receiving tank built, and a ditch was dug from the quarry to the town, about three-quarters of a mile away.

The water had to be lifted about 30 feet, and there was a lot of it, and after investigating several makes of pumps, two Morris steam pumps were decided upon and put to work, and are now draining the quarry at the rate of over three million gallons a day.

The water is piped from the concrete tank to the ditch, which carries it to the town. There it is used to fill the railroad water tank. The railroad, in the past, had been forced

Close-up of Morris Pumps in Action. Note Size of Discharge Pipes.



Looking North Over Flooded Quarry. Crushing Plant in Background.

often to haul water to fill its locomotives, and so effected a great saving in time and expense by utilizing the water from the quarry.

The remarkable thing, as the superintendent remarked, was the volume of water the Morris pumps carried, and the fact that they continued to do so, day after day, with no care or attention other than oiling them occasionally.

Expert Advice and Services

IT is quite interesting to note the many letters and inquiries received by this journal asking for information as to pit and quarry operations. Some cover labor questions, others machinery, its use and selection, others involving stripping and development, some weighing and measuring problems, likewise the solution of handling and storing materials, and many other questions too numerous to mention.

PIT AND QUARRY welcomes these inquiries, as it should be the clearing-house for all such information needed by its readers. It is pleased to have the opportunity of serving its growing number of friends in this and any other manner. At times such questions can be answered directly to the inquirer, the matter being turned over to experts to handle; but as a rule it is considered advisable to incorporate such information into the form of articles and publish in the paper, as questions that are perplexing to one or two readers are likely to confront others, who will likewise welcome the information.

Under such circumstances it sometimes takes several months after receiving the letters before the article can appear in PIT AND QUARRY.

The Golden Gravel Company, Johnson City, Tenn., a recent $50,000 incorporation, will develop sand and gravel properties in the vicinity of Golden, Miss. A plant of considerable proportions and equipment is projected. President of the new company is J. N. Stone, Nashville, Tenn.; vice-president, Lee F. Miller; and George T. Woffington, secretary-treasurers. Both the latter are Johnson City men.

One of Willimantic's prominent and respected citizens, Patrick Rooney, died on March 12. For many years he was a member of the firm of Collins & Rooney, stone quarry operators in the Connecticut town. Up to ten years ago this firm supplied much of the stone used for sidewalks, curbing and foundations of buildings in Willimantic. A widow and one daughter survive him.

Lining Concrete Bins With Steel

A READER asks how concrete bins can be made to stand the wear of crushed stone sliding on the sloping floor of a bin. He states that a few years ago he built a set of concrete bins with sloping hopper floors so that they would empty themselves through a center gate. He used steel reinforcing bars in the slab of concrete, but the continuous wear of the crushed stone on the bottom is rapidly wearing the concrete away.

Although the reader does not say so, the writer knows that the worst of this wear is on the lower part of the slope. The bin once built, it is difficult to remedy this trouble, but if the bins are built properly, this can be remedied.

The way to prevent this wear is to line the slopes of the bins either the entire length or more than half way up from the bottom with steel bars of some kind. These bars should be two inches or more in width and should be placed only an inch or two apart, making most of the surface of steel.

For this purpose old steel rails can be cut to the proper length and embedded in the concrete as it is placed. The rails are placed with the heads down and the base level with the sloping floor. The wide flat base is exposed for the stone to slide upon and only a narrow strip of concrete shows. If rails are not available, then T or H bars can be used. Like the rails, the greater part of the bar is embedded in the concrete, leaving only a flat surface exposed. A flat or square bar is not likely to be embedded deeply enough in the concrete to stand the wear and is likely to work loose.

Round bars, several inches in diameter, will stay in the concrete, but too much concrete surface is exposed, so that it wears away and becomes rough, not allowing the stone to slide as it should.

For this purpose it is often desirable and possible to purchase old rails or T or H bars from second-hand dealers at a much lower price than new steel can be purchased.

An old concrete bin that has become worn can be lined with sheets of boiler plate cut to fit the slopes. To keep these in place is difficult. The best way is to reline them with concrete, placing in this new lining the steel bars, as should have been done in building them. This means a decided extra weight on the supports of the bins. It also means to cut the capacity of the bins somewhat.

Concrete is an excellent material for strength, fireproofness, and durability, but it must be protected from the great wear of crushed stone. The upright sides of bins do not get this wear, but the slopes will, and this is also the case with chutes made of concrete. Chutes are easily lined with steel sheets, but bars can also be used, as described for the bins.

The editors of this journal will be pleased to answer any questions on this subject, or to furnish sketches to any one who may be interested.

At Chattanooga, Tenn., a new sand and gravel company is in progress of formation, headed by H. L. Bible, former owner of the Bible Sand Company. The capital stock of the new company is approximately $300,000. Mr. Bible is authority for the statement that they have leased river frontage at the foot of Pine street, where they will construct a modern sand and gravel handling plant, operating its own barges and dredges. It is proposed to develop a capacity of about 2,000 tons of material per day. A number of the larger contractors of Chattanooga are backing the new concern, it is said, as they are desirous of boosting building activity in this city and surrounding territory by establishing competition, since the new company adds the second company in this line in Chattanooga. George Killian is secretary and treasurer.

You Can't Hold Back a Regular Fellow

Look Out for Your Dynamite

IN THE spring, quarry operators should be very careful of the dynamite they use. During the winter dynamite stored under ordinary conditions and in unheated magazines is subjected to all the vicissitudes of the weather, so it may have frozen and thawed a half dozen or more times.

Such dynamite may not only be dangerous to handle but also to use, as the successive freezing and thawing is likely to cause it to rot or disintegrate. If it is a nitro-glycerine explosive, the globules may run together so that the least shock or concussion may cause a premature explosion. If a stick is cut or broken, and the dynamite turns a greenish tint it is more than likely to be rotting and is dangerous.

It is advisable in the spring to know where and how dynamite has been stored. Safety First.

Service Brothers have assumed full ownership and control of the gravel works on the old Tuolumne river bank, near Old Town, in the vicinity of Waterford, Cal., and the firm hereafter will be known as above. This company now has a present investment in machinery, trucks and buildings in excess of $30,000. It has been in operation only a few months.

S. R. MacNeal, formerly of Lincoln, Ill., has taken a half interest in the Randolph Sand and Gravel Company, Randolph, Minn., situated about 44 miles from St. Paul, and has taken up his residence there.

Limemen Meet in June

Will Hold Annual Three-Day Convention in New York

THE annual convention of the National Lime Association will assemble in New York, June 15, 16 and 17, 1921.

As yet a definite program has not been decided upon, but as far as can be ascertained at this date the general plans for procedure are as follows:

The first day's work will begin with assembly of the members, roll call, and responses by the member representatives. The opening address will be made by the president, outlining the past year's work and the prospects before the industry for the coming year. Appointment of the convention committees will be made, and group conferences will be assigned for the different districts.

Among the production problems, that of lime burning will be the first to be discussed. The phases to be treated will be "Types of Kilns and Fuel Efficiency," which paper will be handled by a well-known expert. This will be followed by a discussion of kilns in relation to fuel economy, and any questions which the members wish to ask may be presented in writing and will be taken up by the speaker. "The New Lime Plant" is the title of a paper to be presented by George B. Wood.

Another discussion will be on "Hydrater and Storage Problems," led by I. Warner, W. E. Carson, G. J. Whelan and Harvey Owen. "Quarry Problems" will also be discussed. Among these will be that of keeping down cost, and possibly the question of relative efficiency of hand and machine methods. Another problem will be quarry control of product, possibly followed by a discussion. Still another discussion will be on the question, "Any Analytical Laboratory in a Lime Plant?"

"Can Lime Producers Carry Their Own Insurance," and "Welfare Work Among Labor," are also possible subjects.

On Wednesday evening, June 15, there will be the usual banquet at which there will be an entertaining talk by Mr. Von Schaack of the Aetna Insurance Company, on "Quarry and Plant Liabilities."

Under educational work for the second day, Tom Wright will present "The Dealer's Part in Educational and Distribution Work." "Lime Stucco," will be presented by D. K. Boyd. An outside speaker will dwell on the "Business Outlook." The moving picture machine will also add its part to the educational features of the second days events. "Lime in Chemical Use" will also be on the tapis. Dr. W. H. MacIntire will present his views on "Lime and Limestone in Crop Production." "Guaranteed Lime Products" is another subject, but it is not yet known who will lead the discussion.

The third day will be devoted largely to organization work, including a view of departmental activities, reports of standing committees, election of officers, resolutions, etc.

After brief shutdown the big crushing plant of the Bangor Cast Stone Products, Company, Bangor, Maine, has resumed operations. They have opened a new gravel bank, which will supply anything from gravel run to crushed, screened and washed. The firm also manufactures reinforced concrete products, saving furnished columns of this nature for some of the finest buildings in the city.

The Scotstown Granite Corporation, New York, has been organized with a capital of $75,000 to operate granite quarries. F. Betrand, W. Glennis and E. Mitchell, 712 West End Avenue, are the moving spirits.

Fig. 1. Loading a car with silica sand by means of water.

Loading Sand Into Box Cars

A SOUTHERN reader asks how he can solve his problem of labor of loading sand into box cars. We are glad to have this question put to us, but regret we are not given more details.

If it is not objectionable to have the sand saturated with water, and the pit is so situated as to allow flooding at a small cost, a centrifugal pump can be used to pump and lift the sand into a trough or chute, and by means of the water carry it to the box-car door at the top of the car and by means of a side chute or trough run the sand into the ends of the car. Boards nailed across the door will allow the water to run out and hold the sand in the car. In Fig. 1, this method of loading an open car is shown, one man attending the operation. At the same plant, box cars are also in the manner described. Silica sand is being handled in the photograph, the same as our inquirer must handle, judging from his letterhead.

If it is not possible to excavate the sand by a pump, then a bucket elevator excavator night be used to elevate the sand to a trough, and water used to carry it into the box car, as already described.

If water cannot be used, either because it may be objectionable, or for a lack of it, there are several other methods, though not so good or cheap. The sand could be elevated to a traveling belt conveyor that would enter the car at the top of the door and by chutes carry the sand to the ends of the car.

Another method would be to use a dragline cable excavator carrying the sand to elevated bins above the top of the car. Chutes from these bins could enter through trap doors in the roof of the car, when there are such, and by other chutes at the top of the door, chuting the sand into either end.

A bucket elevator excavator with a series of belt conveyors could excavate and carry the sand to the car and discharge the sand onto a box-car loader at the open door of the car, this loader depositing the sand in either end of the car. This is illustrated by a sketch in Fig. 2. If it is not possible to load the car from the traveling belt conveyor, or from bins, by chutes, then the same type of box-car loader can be used with those methods.

There may be other methods applicable to the inquirer's pit, but more details would have to be known. The methods suggested are such as would occur to one experienced in this work.

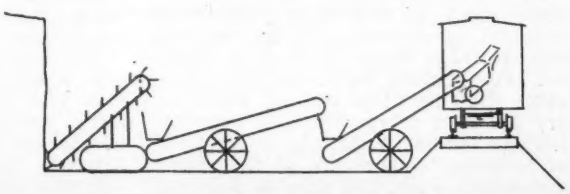


Fig. 2. Series of portable conveyors loading a box car.

New Specifications for Stone Ballast Material and Washed Gravel Ballast

In presenting the following specifications to the twenty-second annual convention of the American Railway Engineering Association, which was held in Chicago on March 15, 16, and 17, the committee recognized the fact that while this material is a manufactured product, and consequently to a considerable extent susceptible of definite specifications, it is not feasible from a practicable standpoint in many cases to obtain ideal stone from which to manufacture ballast. Consequently, no hard and fast mechanical or chemical requirements can be made. Upon recommendation of the committees, the following specifications were adopted by the convention:

SPECIFICATIONS FOR STONE BALLAST MATERIAL

Physical Qualities

General.—Stone for use in the manufacture of ballast shall break into angular fragments which range with fair uniformity between the maximum and minimum size specified herein; it shall test high in weight, hardness, strength and durability, but low in absorption, solubility and cementing qualities.

Tests.—Tests shall be made as follows:

Weight.—Not less than one-half cubic foot of the stone accurately measured, and dried for not less than twelve hours in dry air at a temperature of between 125 and 140 deg. Fahr. shall be weighed. The weight shall be not less than.....lb. per cubic foot.

(NOTE.—Of the stone available, that having the maximum should be used; a high quality stone for ballast will weigh 168 lb. per cubic foot.)

Strength.—Two-inch cubes of the stone shall be sawed to reasonably accurate dimensions and the top and bottom faces made accurately parallel. For primary tests, the test specimens shall be dried for two hours in dry air at a temperature of between 120 and 140 deg. Fahr. and at the time of test the temperature of the specimen shall be not less than 50 degrees. Tests shall be made in a testing machine of standard form and the stone shall have a compressive strength of ..... lb. per square inch.

(NOTE.—Of the stone available, that having the maximum compressive strength should be used; a high quality stone for ballast will have a strength of 10,000 lb. per square inch.)

A secondary test shall be made on specimens the same in all respects as for the primary test except that the blocks shall have completely immersed in clean water, of a temperature between 35 and 90 degrees, for 96 hours, the test to be made within 30 minutes of removal from the water.

If the compressive strength shall have decreased more than ..... per cent from the primary tests, the rock shall be deemed unsuitable for ballast purposes.

(NOTE.—Of the stone available, that showing the least difference between the results of the primary and secondary test should be used; a high quality stone for ballast should show not over 1 per cent difference.)

Solubility.—One-fourth cubic foot of the rock shall be crushed and thoroughly washed. The particles shall then be placed in a glass vessel and covered with clear water. The vessel shall be thoroughly shaken for five-minute periods at 12 hour intervals for 48 hours. If any discoloration of the water occurs, the rock shall be deemed soluble and undesirable for use as ballast.

Wear or Durability.—(Test No. 1). One-half cubic yard of washed stone, which will pass through the maximum and be retained on the minimum screen, shall be spread over a wire mesh or iron surface to a depth of not more than 3 in., and exposed to a dry heat of from 125 to 140 deg. Fahr. for a period of two hours. After the dried stone is carefully weighed it shall be given 10,000 revolutions in a tumbler approximately four feet in diameter, of not less than two cubic yards capacity, and operating at 25 revolutions per minute.

The sample shall then be passed over a screen of the minimum dimension provided for sizing the ballast, again washed and dried in the same manner as before the test, and again carefully weighed.

If the decrease in weight shall be more than ..... per cent of the

original weight of the sample, the stone shall be deemed unfit for use as ballast.

Outside of the breakage, which is exhibited by the small particles which will pass through a minimum screen but will not pass a sieve of 20 meshes to the inch, the wear should not exceed ..... per cent.

(NOTE.—Of the stone available, that showing the smallest loss in weight should be used; a high quality stone for ballast will show a loss of not more than 1 per cent in fragments which will pass a screen of 20 meshes to the inch, and not more than 3 per cent in those passing the minimum sizing screen.)

Test No. 2 (Quick Weathering Test). One-half cubic yard of stone shall be dried and weighed as for Test No. 1. It shall then be immersed in water for six hours and then while still wet, be placed in a refrigerating plant and subjected to a temperature of approximately zero Fahr. for two hours. It shall then be removed and the temperature gradually raised in two hours to 100 degrees and that heat continued for two hours, when it shall be immersed as before and again subjected to approximately zero temperature.

The freezing and thawing shall be repeated to a total of ten exposures. If any tendency to disintegrate is observable the stone should be considered unsuitable for ballast. Otherwise the material shall again be subjected to a wear test as provided under Test No. 1. If in this wear test the maximum decrease in weight shall be in excess of ..... per cent, it shall be deemed unsuitable for use as ballast.

(NOTE.—Of the stone available, that showing the minimum average decrease in weight should be used; a high quality stone for ballast will not show a decrease in fragments which will pass the minimum sizing screen of more than 4 per cent.)

Absorption.—One-half cubic yard of washed stone, which will pass through the maximum and be retained on the minimum screen, shall be spread over a wire mesh or iron surface to a depth of not more than 3 inches, and exposed to a dry heat of from 125 to 140 deg. Fahr. for a period of 6 hours. After the dried stone is carefully weighed it shall be submerged in clean water for a period of 96 hours. It shall then be removed from water and exposed to a normal air in the shade and at a temperature between 40 and 80 degrees, and allowed to drip for 30 minutes, when it shall again be weighed and the difference in weight shall be used to determine the rate of absorption. Stone showing an absorption of more than ..... lb. per cubic foot is unsuitable for ballast.

(NOTE.—Of the stone available, that showing the minimum absorption should be used; a high quality stone for ballast will have an absorption of not more than 0.50 lb. per cu. ft.)

Cementing quality.—A five-pound sample of the rock thoroughly washed and dried shall be crushed until it will pass through a screen of one-fourth inch mesh. This material shall be placed in a ball mill which contains two steel shot weighing 20 lb. each, and the mill revolved at the rate of 30 revolutions per minute, until it has made 2,000 revolutions for each pound of sample in the mill.

Sufficient clean water shall be added to a make a consistent mortar, which shall then be moulded into one-inch cubical briquettes, formed under 10 lb. pressure. All of the briquettes shall then be allowed to dry 20 hours in air, when one-third of them shall be tested for compressive strength.

One-third shall be kept for four hours in a steam bath, and the remainder shall be immersed for four hours in clean water at a temperature between 50 and 60 deg. Fahr. and then tested for compressive strength.

If in any of these tests a compressive strength greater than ..... lb. per square inch is developed, the material shall be deemed unsuitable for ballast.

(NOTE.—Of the stone available, that from which the briquettes show the minimum strength should be used; a high quality stone will show not to exceed 4 lb. per square inch.)

Requirements

Breaking.—Stone for ballast shall be broken into fragments which range with fair uniformity between the size which will in any position pass through a 2½-in. ring and the size which will not pass through a ½-in. ring.

Test for Size.—(Maximum). A sample weighing not less than 150 lb. shall be taken from the ballast as loaded in the cars and placed in or on a screen having round holes 2¾ in. in diameter. If a thorough agitation of the screen fails to pass through the screen 95 per cent of the fragments, as determined by weight, the output from the plant shall be re-

jected until the fault has been corrected.

(Minimum). A sample weighing not less than 150 lb. shall be taken from the ballast as loaded in the cars; weighed carefully and placed in or on a suitable screen having round holes ½-inch in diameter. The screen shall then be agitated until all fragments which will pass through the screen have been eliminated. The fragments retained in the screen shall then be weighed and if the weight is less than 95 per cent of the original weight of the sample the output of the plant shall be rejected until the fault is corrected.

Handling.—Broken stone for ballast must be delivered from the screens directly to the cars or to clean bins provided for the storage of the output of the crusher. Ballast must be loaded into cars which are in good order and tight enough to prevent leakage and waste of material and are clean and free from sand, dirt, rubbish or any other substance which would foul or damage the ballast material.

Inspection.—Inspectors representing the purchaser shall have free entry to the works of the manufacturer at all times while the contract is being executed, and shall have all reasonable facilities afforded them by the manufacturer to satisfy them that the ballast material is prepared and loaded in accordance with the specifications and contracts.

In case the inspection develops that the material which has been or is being loaded is not according to specifications, the inspector shall notify the manufacturer to stop further loading and to dispose of all cars under load with the defective material.

As the quarry deepens or is enlarged, further tests shall be made of the material whenever conditions indicate a change in the quality of the stone, or where in the judgment of the engineer for the company, a further test is advisable. Should such tests show that the stone fails to meet the provisions of these specifications, it shall not be used for the manuracture of ballast.

Measurement.—Ballast material may be reckoned in cubic yards or by tons, as expedient. Where ballast material is handled in cars, the yardage may be determined by weight, after ascertaining the weight per cubic yard of the particular stone in question by careful measurement and weighing of not less than five cars filled with the material, or the tonnage may be determined for subsequent cars by measurement and converting the yardage into tonnage by use of the weight per yard as determined above.

Specifications for Washed Gravel for Ballast

1. Gravel for ballast shall be so prepared that dust, loam and dirt are removed, that all aggregates that will not in any position pass through a 2½-in. ring are rejected; and that the sand contained in the ballast shall not, in volume, exceed 20 per cent nor be less than 15 per cent of the material as loaded for use.

Test No. 1. Dust, Dirt or Loam

2. A sample of the prepared ballast containing one-eighth (⅛) cubic foot shall be placed in a watertight receptacle having a capacity of not less than one (1) cu. ft. Into this receptacle shall then be placed two quarts of clear water after which the receptacle shall be agitated until the gravel is thoroughly washed. The water shall be drained off immediately and placed in a glass jar and allowed to settle. If the sediment deposited in the bottom of the jar is more than one-half (½) of one (1) per cent of the volume of sample the output of the plant shall be rejected until the fault has been corrected.

Test No. 2. Large Aggregate.

3. A sample weighing not less than 150 lb. shall be placed in or on a screen having round holes 2¾ in. in diameter. If a thorough agitation of the screen fails to pass through the screen 98 per cent of the material, as determined by weight, the output from the plant shall be rejected until the fault has been corrected.

Test No. 3. Sand.

4. One cubic foot of the prepared ballast shall be thoroughly dried, placed in a screen having ten meshes to the inch and the screen agitated till all particles which will pass have passed through the screen. If the material which passes through the screen exceeds 20 per cent or is less than 15 per cent in volume of the original sample the output shall be rejected until the fault has been corrected.

5. In case inspection develops the

(Continued on page 72)

Good "Agestone" Business

Illinois Company Has a Prosperous Trade Among Farmers

THE Illinois Limestone Company, near Robinson, Ill., is building up a good business in agricultural limestone in its own and adjoining counties.

Last fall this company piled up a considerable surplus stock, as the photographs will show, but this is practically all gone at the opening of the present season.

The limestone is quarried from a surface strata and approximately one million tons are available on seventy acres.

The plant is devoted entirely at present to the production of agricultural limestone. About 15 to 20 men are employed and the daily output is 100 to 150 tons of finely pulverized "agstone," about 70 per cent of which will pass through an eighth inch mesh screen and all of which passes through a quarter inch mesh.

In color, the pulverized stone is reddish brown, due to the presence of small amounts of iron compounds. An analysis of the mill run product as sold, shows a uniformly good product, some tests running as high as 96 per cent pure calcium—carbonate limestone.

A Gruendler crusher is used for pulverizing.

Announcement is made by Dawson Belting Company, New York, that on and after March 21, their new address will be 96 Warren street, New York. This company's line of goods consists of Balata, Stitched Canvas, Solid woven and Leather Belting, and their strict adherence to their policy of prompt service and uniformly high quality has been the means of such a decided increase in business as to necessitate a move to more spacious quarters. The same high standard of service will be maintained as heretofore.

Blasting by Tunnels

IN THE December issue of PIT AND QUARRY appeared an article on driving small tunnels, for blasting deep ledges. This article, appearing on pages 50 to 52 of that issue, described in detail the method except that nothing was told as to how to put off the large blasts.

This part is very important as the success of the blast must depend upon the placing and size of the load. There are a number of different methods of charging these tunnels, and there is no hard-and-fast rule that can be followed, for much depends upon the character of the rock and depth of ledge.

There is a tendency in most hard rocks to break it up in excessively large boulders that must again be broken, consequently care should be exercised to place the charges so that the entire mass is loosened and upheaved, yet the boulders should be broken for handling.

In Fig. 1 is shown a tunnel covering about 5,000 square feet of quarry area, there being about 175 lineal feet of tunnel. With a breast of rock 81 feet high there would be 15,000 cubic yards lying over these tunnels and this amount of rock and possibly 10 to 20 per cent more can be loosened by the charges to be placed. If it is estimated that 5 tons of explosives are needed for this blast, then it would be possible to divide this 10,000 pounds into four charges of 2,500 pounds each and place them in the tunnel as shown in Fig. 1, namely at the end of each drift. Effective blasting can be done by such a system of charging and it will cost less to place the charges in this manner than to break them up and space them as shown in Fig. 2. However, such spacing of the loads will have a tendency to break the rock so as to give many large boulders that will afterwards have to be broken with explosives, and it can be seen that the quarry floor will be left with many high places as the explosive's radius of breaking will hardly be great enough to reach on the level from one charge to the other. The extra cost of breaking up boulders and taking up bottom is likely to be much greater than that of dividing the charge into smaller units.

In Fig. 2 is shown the 10,000 pounds broken up into nine charges. Thus no charge is more than 20 feet from the others, so that the explosives are evenly distributed, breaking all the material much smaller, and breaking the bottom to better advantage.

In placing the charge the dynamite is packed in the bottom as shown in Fig. 3. A concrete wall from 18 to 24 inches thick is built on both sides to confine the load and make the explosive more effective. Ducts are left through the top of the wall to carry the wires. It is advisable to place three or four exploders in the charge so as to make sure of an instantaneous explosion. The rest of the space between the walls is filled with packing so as to prevent any dead air space being in the chamber.

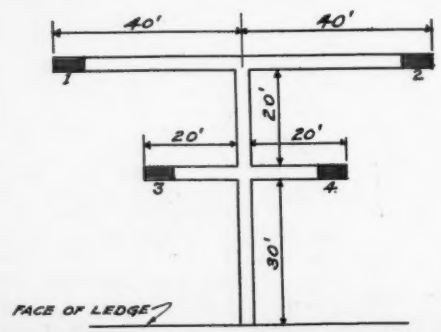


FIG. 1 SHOWING ONE METHOD OF CHARGING TUNNELS.

One of the unsatisfactory results of

tunnel blasting under deep ledges is that the top of the ledge is thrown down in a large mass. To prevent this, deep well holes are driven from the top and shot either with the tunnels or just ahead on another series. This makes the charges in the tunnels more effective.

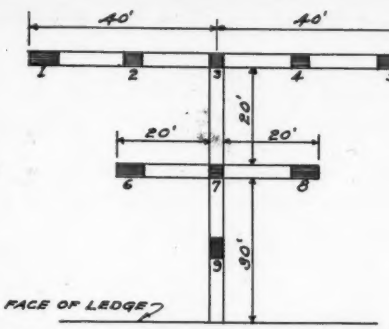


FIG. 2 SHOWING SECOND METHOD OF CHARGING TUNNELS.

Thus with the holes on top of the ledge and a series of two or more sets of tunnels in the base of the ledge it is possible in many quarries to throw down enough rock in a single blast to keep the crushers going for several months and possibly for a season, and at a small cost. Some of the largest quarries of the country have tried the tunnel method of blasting and found it so satisfactory that they are repeating it.

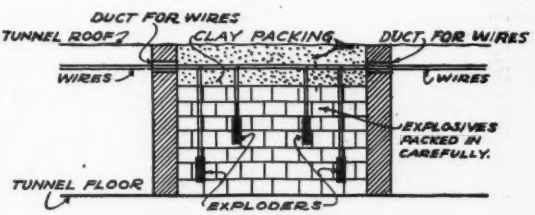


FIG. 3 METHOD OF LOADING TUNNEL

Gravel for Maintainance

Indiana Highway Department Wants Information From Producers

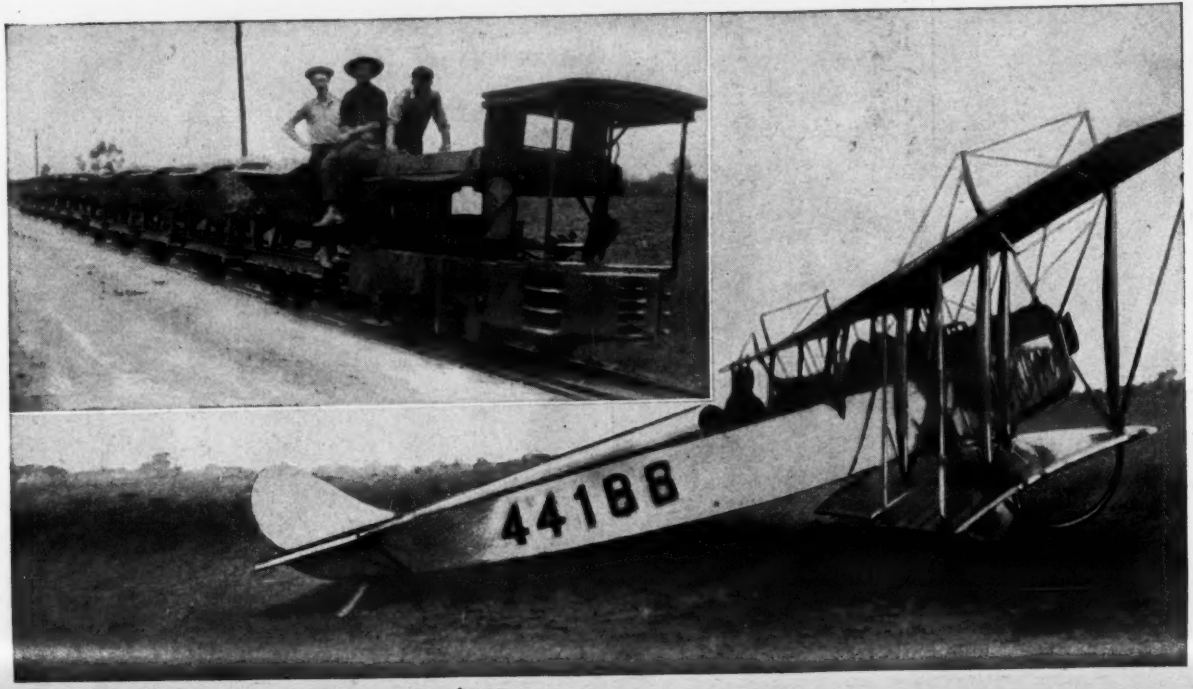
Mr. J. R. Hiatt, purchasing agent of the Indiana State Highway Commission, requests that all producers of maintenance gravel write him immediately, giving the date on which they expect to begin operation of their plants for 1921. Requisitions are coming in from the field, and he desires to waste as little time as possible in starting spring shipments.

This information is sent out in a bulletin of the Indiana Sand & Gravel Producers Association. R. C. Yeoman, extension engineer, also states:

Gravel road maintenance will receive more attention this year than ever before. The coarse material with soft sand taken out will be in demand. The roads now have an excess of worn out fine material on the surface to serve as a binder. The addition of soft sand (below ⅛ inch) in any quantity, except as tolerance, will seriously weaken the bearing power of the road surface. Road superintendents should be acquainted with the difference in value of the prepared materials as compared with the average pit run. Eventually the prepared materials will have to be used to save the roads. Why not now?

Citizens of Danville, Ill., are objecting to the location of sand and gravel pits within 100 feet of any street or alley, or 100 feet of any residence. A bill to this effect was introduced in the city council of the Illinois city on March 14, making a violation of this ordinance liable to a fine of $25 to $200. The measure was referred to the corporation counsel to be passed upon before being voted on by the council. It is stated that sand and gravel pits become breeding places for vermin and a menace to health, since they are used as dumping grounds for refuse.

PLYMOUTH



a 3-ton Plymouth Gasoline Locomotive, for use in water bound road construc-

pense with the Plymouths would mean haulage problems hard to solve."

a 3-ton Plymouth Gasoline Locomotive, for use in water bound road construction. It made five ten mile round trips daily, hauling twelve yards the load, "putting it all over a nine-ton steam," as Mr. Hutchinson put it.

In 1917, Mr. Hutchinson purchased another 3-ton using in the construction of the Selfridge Aviation concrete road twenty feet wide.

In a letter he says that: "To dispense with the Plymouths would mean haulage problems hard to solve."

Mr. Hutchinson is both a Plymouth and airplane enthusiast, and is shown in the rear seat of the plane above ready for an inspection trip over his road job. He is probably the only road contractor making such use of the airplane.

Ask us for Special Road Bulletin.

The Fate-Root-Heath Co., Plymouth, Ohio, U. S. A.

PLYMOUTH

Gasoline Locomotives

Mining Pebble Phosphate in Florida

In mining pebble phosphate, both mining and stripping ordinarily have been done hydraulicly. The war, however, interrupted the demand for phosphate and the various companies are now so far behind with their stripping that much steam shovel and car equipment has been installed to speed up the work. For example, the International Agricultural Corporation, whose mines and plant at Mulberry, Fla., are among the largest in the world, has let a stripping contract to W. Z. Williams Company, Incorporated, of Macon, Ga. These well-known general contractors have contracted to operate four shovels for a period of one year, and take off 2,000,000 cubic yards of overburden.

It will be interesting to survey these Florida operations, where from 18 to 24 feet of overburden is being taken off to get at from 6 to 10 feet of phosphate rock.

One superintendent went on to the job about the middle of last September, at the close of the rainy season, to install his first shovel. He found a pond of water on the spot, near Mulberry, where he was supposed to dig. That fact indicates the chief difference between phosphate-stripping in Florida and steam-shovel excavation elsewhere. Water is the problem—not to get water, as in the Southwest, but to get rid of it. The country is low and flat, full of water, difficult to drain. This man started operations by digging a coffer-dam around his shovel and pumping out the water by means of a steam syphon. As for the water supply, wells can be sunk anywhere and water found, from 18 to 24 feet under the surface. The chief difficulty is to control the water in the cuts and mined pits, into which the overburden is dumped. It seeps in constantly, and is pumped out by means of electrically driven centrifugal pumps. It is impracticable to dump into a wet pit, for there would be constant danger of the fills slipping. In spite of every effort there has been considerable trouble of this kind. On one occasion the track slipped out and sent a train of loaded dump cars down 25 feet to the bottom of the pit. The cars, however, were sturdy and no damage resulted beyond the bending of a few rods.

On this particular job the contractor is using 54 Western side-dump cars of 12 cubic yards capacity, and loading with Marion and Vulcan shovels. An average of 40,000 to 45,000 yards to a shovel per month is being made. Two trains are operated from each shovel, eight 12-yard dump cars to a train. The cuts are taken out in three lifts. At mine No. 10 there are 650,000 cubic yards to move, the overburden being dumped into a mined-out pit. In the latter part of December, when the photographs were taken, there was still some phosphate to come out. Later a second dump was to have been established on the opposite side of the pit, one dump being 800 feet long and the other, about 400 feet.

At mine No. 5 there is one novel feature. The cut and fill are on opposite sides of the same work track, with a haul of only a few hundred feet between. Here also hydraulic mining and stripping are in progress at the same time.

The International people themselves are stripping both hydraulicly and by means of two draglines, with 100-foot booms, the phosphate being mined back of the dragline, as in coal stripping, except that coal is taken out with small shovels back of large stripping shovels. At mine No. 9, opened in January of this year, the phosphate rock is much harder than elsewhere and considerable shooting will be necessary.

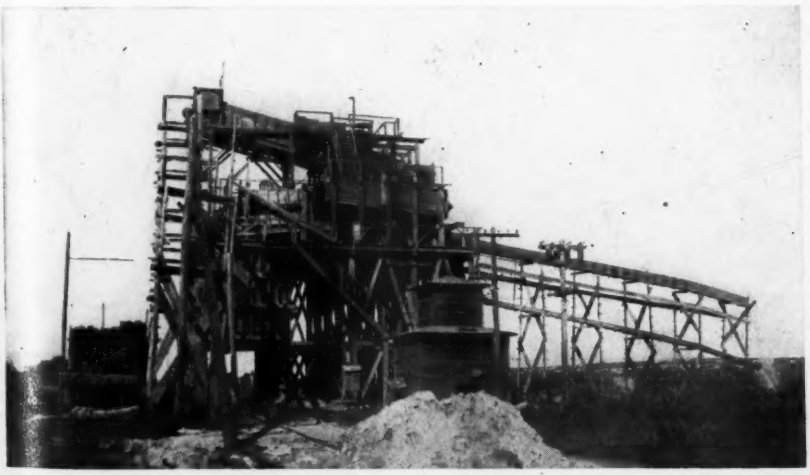
In mining, "hydraulic guns" are worked in pairs, two 2-inch streams of 100 to 125 pounds pressure. These streams separate the rock and wash it into a sump, from which it is pumped in solution to a washing plant. After the foreign matter has been removed, the rock is taken to a great central drying and screening plant, from which it emerges into enormous bins, graded according to the content. There are three to four grades, ranging from 65 to 82 per cent B. P. L.

The International Agricultural Corporation runs its trains by electric

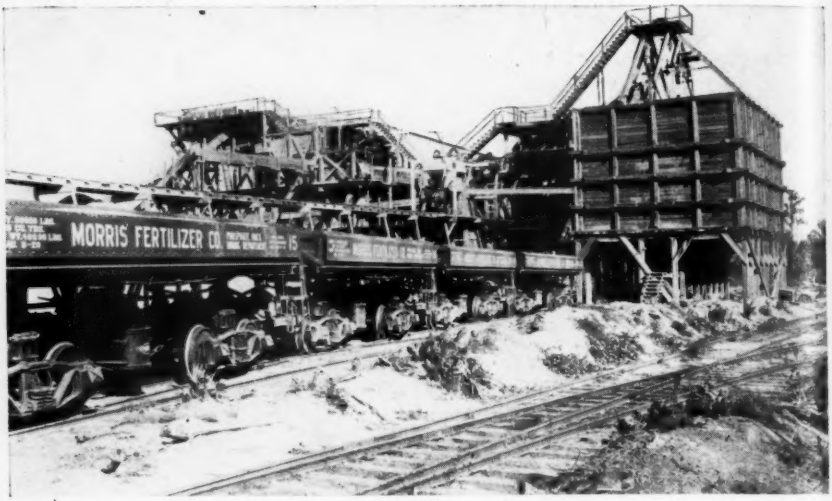
At one of the mines of International Agricultural Corporation.

power. There are 60 miles of standard trolley operated from a central power plant at Prairie. The fuel used is crude Mexican oil, received through the Port of Tampa. The contractors, however, are using coal, rather than equip their locomotives and shovels for burning oil.

The Morris Fertilizer Company has a very complete phosphate mining plant at Bartow, Florida, in the same general locality. This company is doing its own stripping, by means of both hydraulic streams and steam shovel, loading into Western dump cars. The general operation is similar to that previously described, except that instead of using bottom-dump cars for hauling phosphate rock from the washer to the wet-bins at the drying plant, four Western 20-yard automatic air-dump cars have been installed for the purpose and are proving very practical. At the present time these dump cars are being operated at night, in order that the loco-



Typical washing plant.



Morris Fertilizer Company's operation near Bartow.

motives may not be diverted from the important stripping work during the day. In connection with the crusher there is a long supplementary tunnel-bin, which feeds into the crusher by belt conveyor.

Another big concern, operating in the vicinity, is the Phosphate Mining Company of New York. This company is operating mines at Nichols, Christina, Mulberry and Bartow.

The Southern Phosphate Company is operating mines between Mulberry and Bartow and has a dragline at work, stripping near Lakeland. There are other operations of a similar character to those described, some twenty altogether, but enough has been written to show the scope and methods of a great industry, which has put Florida on the map as a mining state.

Hydraulic mining in foreground, steam shovel stripping in background.

Highway Construction for 1921

Outlook Bright for Increased Activity in Road Building

REPORTS received from the several state highway commissions indicate that there will be a good increase in highway construction in the early summer. There has been no hurry about letting contracts this year, owing, doubtless, to the slowness in voting appropriations for highway construction, but there are bids open for a good many miles of gravel, concrete, and macadam highway, which will mean some nice business.

The car shortage of last year undoubtedly is responsible for the hesitancy in signing contracts, because a contractor naturally wants to feel reasonably assured that he will be able to get deliveries on sand, gravel and crushed stone before signing a contract for road construction. The prospects look favorable, however, for more satisfactory service this year. A list of contracts let this year, contracts still to be let, and contracts held over from last year, follows:

Alabama will let contracts during the spring and summer for 160 miles of concrete and macadam road, and 2,000 lineal feet of steel and concrete bridge. There are 151.79 miles of road contracts held over from last year.

Arkansas has 4,037 miles of road-building under consideration, including some concrete, a good deal of macadam, gravel and stone, and some sand and clay. This project is to cost approximately $56,000,000, of which $21,700,000 is available.

The amount of mileage to be contracted for during 1921 in Delaware is still uncertain, waiting for legislative action. About 56 miles of concrete road are held over from 1920.

Idaho has extensive road building projects under consideration, but will not let contracts before July 1, 1921.

Illinois has about 125 miles of concrete, macadam and gravel road to award during the year.

Indiana will let contracts for about 125 miles of hard surfaced road during 1921, and has about 100 miles held over from 1920.

Kansas has let, so far this year, contracts for 27 miles of hard surfaced road to cost $224,241. There are 141.-288 miles still to be contracted for, and 238 miles held over from 1920.

Kentucky has awarded so far this year, contracts for 46 miles of highway, a large part of which is macadam and gravel. There are projects for 150 miles to be let during the year, and about 150 miles held over from last year.

Maine has around 175 miles of hard surfaced road contracts to award during 1921, and 100 miles held over from 1920.

Massachusetts has awarded contracts for 15 miles of concrete and macadam road, has $4,000,000 of contracts to award during the year, and about 30 miles of concrete and macadam road held over from 1920.

The road building projects in Missouri are still undecided. It is understood, however, that as soon as the legislature acts on appropriations, bids will be received for a good mileage of hard surfaced road.

Nebraska has about 250 miles of road contracts to be let during 1921, and 100 miles held over from 1920.

New Hampshire has 36 miles of cement and macadam road held over from 1920, and contracts for new projects will be let in the near future.

Nevada has 51.4 miles of road construction held over from 1920, and has extensive projects nearing completion for construction this year.

North Dakota has 585.6 miles, consisting mostly of hard surfaced road, to let this year, and 249.2 miles held over from 1920.

Oregon has awarded contracts so far this year as follows: 16.3 miles of cement pavement at $36,500 per mile; 38 miles of stone and gravel surfacing at $6,700 per mile. Approximately $17,000,000 are available for highway work during 1921 and 1922, and it is estimated that not less than $8,000,000 of contracts will be awarded during 1921. There are a few small contracts held over from 1920.

Rhode Island has 11.8 miles of cement and macadam road contracts to let so far this year, and expects to add to this mileage considerably. There are 29 miles held over.

South Dakota will receive bids after April 1st for 106.96 miles of road. A large part of this is dirt road, but there is a good mileage of macadam and gravel road included. There are 546.06 miles held over, about 35 per cent hard surfaced.

Texas has, perhaps, the most extensive program of any state for 1921. Contracts for 210.88 miles of hard surfaced road, to cost $2,279,472.73, have been let so far this year. There are 73.8 miles, to cost $1,014,715.51, still to be let, and 447.3 miles, to cost $2,593,405.95, held over from 1920.

West Virginia is also convinced that good roads mean prosperity. Contracts for 34 miles of hard surfaced road have been let so far this year, and $5,000,000 is available for additional contracts. There are also about $5,000,000 worth of contracts held over from 1920.

Wisconsin has awarded contracts for 35 miles of concrete and 60 miles of gravel road so far this year. It is estimated that contracts still to be let will total $11,000,000. There are approximately $4,000,000 of contracts held over from 1920.

Wyoming has so far let no contracts for 1921 construction, but as soon as the legislature passes on bills before it, bids will be called for large mileage. There are $1,500,000 of contracts held over from 1920.

It will be seen from these statistics that while the number of contracts let so far this year is not large, the amount of mileage still to be contracted for is considerable, and as soon as the state legislatures recover from their winter lethargy, the work can go forward without delay.

The public is clamoring for better roads—hard surfaced highways—and they will get them. Of course, taxes are already high, and the expense of running the states' governments is great, but one of the first requisites to national prosperity is good roads, and the realization of that truth cannot much longer be delayed.

New Ballast Specifications

(Continued from Page 62.)

fact that the material which has been or is being loaded is not in accordance with these specifications, the inspector shall notify the manufacturer to stop further loading until the fault has been corrected, and to dispose of all defective material that had been loaded in cars, which shall be done at the expense of the contractor.

6. When ballast is being paid for by the ton, and it is impracticable to weigh each car, the weight per yard shall be obtained by weighing at frequent intervals not less than five cars loaded with ballast, the contents of which have been carefully measured. The weight per yard obtained by such a test shall be used in figuring the weight per car until another test is made.

7. When ballast is paid for by the yard, the amount shall be determined by weighing each car, where practicable, and applying the weight per yard as determined by frequent tests. When impracticable to weigh each car, the contents of each car will be carefully estimated by comparison with cars, the contents of which have been actually measured.

Hoosier Legislature

News of Things the Lawmakers Have Done, and Other Indiana Matters

By Our Indianapolis Correspondent

A BILL introduced in the Indiana senate recently by Senator Nejdl of Lake County, providing for the repeal of a law under which the present state highway commission operates, was referred to the committee on roads. The bill provides that after the commission completes its business that available funds shall go to the school fund. The construction of highways would be placed in the hands of counties should the bill pass.

Provided the county commissioners will permit new roads to be built in Vanderburg County, the Vanderburg, Ind. county Council has agreed to confirm the expenditure of approximately $750,000 for the same, to be planned by the state highway commission and superintended by an engineer appointed by the commission.

The annual executive board meeting of the International Cut Stone Contractors' and Quarrymen's Association was held in Indianapolis recently and was attended by stone contractors and quarrymen from various large cities of the United States. Due to the high cost of labor and freight rates, many stone contractors and quarrymen expressed the belief that there would be no great reduction in the price of stone and decorative building materials, and assert that the gradual reduction in construction work has been due to the response of public appeal rather than to a drop in the price of materials. Among other subjects discussed at the meeting were those pertaining to the serious lack of employment among skilled stone workers, unfair foreign competitive shipping rates and the mounting costs of maintenance. The following association officers attended the meeting: Walter W. Drayer, Indianapolis, president; A. J. Burrage, Indianapolis, secretary, and E. E. Dickinson, Bedford, chairman of the executive committee. J. B. Gillie, New York City; Mastin Simpson, Kansas City, Mo.; Charles G. Fanning, Chicago; George Oakley, Toronto, Ontario; Arthur Jones, Minneapolis, Minn.; A. J. Thompson, Boston, Mass.; Samuel Ledderer, St. Louis, Mo.; Arthur Michie, Bedford, Ind.; C. W. Walters, Cleveland, O., and Henry Struble, Chicago, all members of the executive committee.

The bill providing for patrol maintenance of highways, and extending the term of appointment of the county highway superintendent and requiring each county superintendent to attend the road school at Purdue University at least one week in each year, and which would also authorize the establishment of the patrol system by counties, was signed by Governor McCray, March 8.

H. C. Boyden, of the Portland Cement Association, condemned the concrete mixtures used by many road and building contractors, in an address on "The Recent Developments in Concrete," at a meeting held under the auspices of the American Association of Engineers at the Chamber of Commerce recently. He stated that at least 60 per cent of the efficiency of concrete was lost by the use of sloppy concrete mixtures. He discussed the proper methods of use of concrete as revealed by experiments made in the laboratories of the association in Chicago. Mr. Boyden spoke the same day at a luncheon of the Rotary Club describing the growth of concrete, explaining that there was only one mile of concrete road in the United States in 1892, in 1909 there were fifty-six miles and today there are more than 17,000 miles.

The Bloomington Stone & Construc-

tion Company, of Bloomington, Ind., has filed a preliminary decree of dissolution.

Wm. R. Goodall, 64 years old, supervisor of stone quarry operations in the Bedford district, died recently following an illness of several months.

The Columbus Gravel Company, of Columbus, Ind., has increased its capital stock from $5,000 to $15,000.

A bill which would make it a misdemeanor for contractors to accept payment for any given piece of work and after having accepted payment then failing to pay the material bills, has been passed by the Indiana legislature and signed by Governor McCray. The bill is strict in its wording and will relieve those sand and gravel producers who sell to building construction contractors, of a lot of worry about where and when the money is coming. Heretofore the sand and gravel interests have had to resort to liens against the property. They are not barred from this procedure under the new legislation, but the contractor, if he fails to pay the bills, may be fined up to $1,000 and given up to a year on the State Penal Farm.

R. C. Yeoman, extension engineer of the Indiana Sand and Gravel Producers Association, spent some busy days during the past legislature. Several bills were presented that indirectly had a bearing on the sand and gravel producers of the state. Virtually every bill detrimental to the industry either died in committee or was defeated before it got far. Officially the association has appointed no one to take the place of E. Guy Sutton, the business manager, but Mr. Yeoman has taken over the work in addition to the extension engineering department.

C. J. Reilly has resigned his position with the Sandusky Cement Company as general superintendent and has accepted a position with the same company to take charge of its white Portland cement plant at York, Pa.

Barrel for Tempering Steel

IN every blacksmith shop there must be tubs of water for tempering the steel of the newly sharpened drill points. The ordinary dip tub will answer the purpose; but in doing this important work, using one tub, much time must be lost either by the blacksmith or his helper in holding the drills in the tub. This waste of time has been overcome in the blacksmith shop of the Neverson Granite Quarry at Neverson, N. C.

Three oil barrels sawed off are planted in the ground. The first barrel is only half a barrel and is used entirely as a dip tub for short bits. The second barrel is three-quarters of a barrel with a piece of the head left in. A hook is driven into the wall of the shop to hold the steel, the barrels being placed near the wall of the building so as to be out of the way and allow of the use of the wall. Thus any piece of steel no longer than the height of the building, after being dipped can be allowed to stand in the tub to temper.

The third barrel is laid partly on one side and can be used for dipping or with the two rests made of round iron can hold the steel in the barrel, either short pieces or very long ones.

This is a cheap and inexpensive arrangement and one that anyone can fix for himself. Plugs in the sides of the barrels will admit of the old water running out to allow fresh water to be put in.

Security Lime & Cement Company, Baltimore, Md., some time ago resumed production at its large mill at Security, near Hagerstown, Md. The cement works had been closed down since the middle of December, during which time some necessary repairs and improvements have been made at the plant. For the present the plant will be operated at about three-fourths of its normal capacity, giving employment to about 200 men.

Works All the Year

Canadian Plant Making Success of Continuous Operation

THE Canada Crushed Stone Corporation, of Dundas, Ontario, Canada, is a year-round plant, and as such, we believe that a few facts concerning it will interest PIT AND QUARRY readers.

Mr. C. M. Doolittle, the president of the company, has installed the latest and best equipment and many labor-saving devices, with the result that in the year 1920, the plant produced around a half million tons of stone without shutting down for repairs a single day.

An electric clock checking device indicates on a chart the exact time that each train-load of rock is dumped into the crusher, and if there is an unusual delay, it shows on the chart and the foreman is required to make an explanation.

The quarry is situated on a hillside, about a mile from Dundas, and is a gravity plant. The company is working three levels, and uses twelve Cyclone well drills, which enable them to always keep a good supply of rock broken up for the shovels.

The main operations extend for nearly a mile, and the rock is loaded into the cars by two 120-ton Marion steam shovels, and one 120-ton Bucyrus steam shovel. Six Vulcan locomotives haul the rock to the crusher, which has a capacity of 4,000 tons a day. A large amount of rock is always kept broken up ahead of the shovels, so that they never have to wait for shooting, and the two shovels have loaded as many as 108 six-car trains in a day.

The crushing plant consists of one McCully crusher, followed by two 72x30 inch Garfield rolls. Thus in two crushing operations the stone is reduced, from the size loaded at the quarry by a 3½-yard dipper shovel, to 2½ and 3 inch sizes. From the Garfield rolls, the product is conveyed to the screen house on belt conveyors to four revolving screens. The oversize stone is recrushed by 54x20 inch Superior rolls.

We have seldom seen a more efficient, smoothly run plant, or one where the employees seemed so satisfied and interested in their work. This, together with the fact that the stone is reduced to 2½ and 3 inch sizes in only two crushing operations, make the plant one of unusual interest to all quarry operators.

The production in January of this year was 41,000 tons, of which 36,000 tons were shipped. The company is just finishing an open stripping job, which will make about 300 000 tons of rock available. They have reserve piles of about 45,000 tons, to use in emergencies.

Mr. Doolittle employs about 120 men at present, but this number varies at times, his maximum payroll being 137 men. About 80 men are employed in quarry operation, and the balance on stripping and construction work. He uses a bonus system which is working out very satisfactorily, and has had no labor trouble whatever; the employees take a keen interest in the success of the plant, and seem to feel an unusual sense of responsibility in its welfare.

Mr. Doolittle's success in operating the year round is due largely to the fact that he has persuaded the provincial and county highway officials to purchase rock during the winter months and store it, thus having it in readiness for spring roadbuilding work.

All of the crushing machinery is the product of the Worthington Pump and Machine Corp., and most of the conveying machinery was supplied by the Stephens-Adamson Mfg. Co., of Aurora, Ill. E.

Reform in Handling Explosives

Bureau of Mines Points Out Some of the Dangers in Present Methods

THAT in the manner of handling explosives reforms are needed that will safeguard life and property better than heretofore, is declared by the United States Bureau of Mines in a bulletin reviewing the work of the wartime regulation of explosives, just issued. The United States, says the author, Dr. Charles E. Munroe, is practically the only civilized government in the world that fails to exercise permanently a national supervision over the manufacture, storage and use of explosives, and under peacetime conditions it is easier to obtain explosives in this country than in any other. Some of the states have no laws of any kind relative to explosives, while in most other states any quantity of explosives may be freely obtained for any purpose.

Large stores of explosives have been found by the Bureau of Mines within the limits of cities and towns where an explosion might have caused loss of life, limb, and property. Powder magazines are in many cases of improper construction, not proof against fire or bullets, and without guard protection.

Not a few accidents to children have been attributable to the careless manner in which powder magazines are locked or secured, and to the abandoning of explosives in quarries and excavations. Occasionally, miners have taken frozen explosives home for the purpose of thawing them, and have blown up themselves and their homes. There have been instances where state convicts used dynamite in their work on the public roads, left it hidden, and when their terms have expired, recovered the explosive and used it for safeblowing or other criminal purposes. The wholesale destruction of fish by the dynamiting of streams is a common offense. The protection of eminent citizens and of property against bomb outrages is a matter closely connected with proper explosives regulation.

Explosives are fundamental necessities of modern civilization, and their uses in industry are so varied and extensive that their safe disposition and employment is a matter of capital importance to every citizen. For economy and efficiency in use, it is imperative that explosives should be readily accessible. As a result they are distributed like other general merchandise, and in the absence of regulation and supervision, may be obtained easily by any one. On account of the enormously extended use of explosives during the war thousands of persons acquired familiarity with their handling and use. With state regulation, there could be an accounting for explosives manufactured or used and means of guaranteeing safe storage.

In the year 1919, in peace time, there were manufactured in the United States 417,634,470 pounds of explosives. In normal times over 31,000 mines and quarries use explosives. About 55,000 wholesale and retail dealers handle explosives and over 18,000 concerns engaged in the construction of railroads, highways and waterways use explosives. Altogether, there are over 100,000 concerns using such comparative large quantities of explosives that special magazines for their storage are an absolute necessity. There are probably more than 500,000 individual consumers of explosives.

The bulletin reviews the work of the wartime regulations of explosives which was entrusted to the Bureau of Mines. In the course of the war 16,000 agents were commissioned by the bureau to assist in this regulation. Half a million licenses for the manu-

facture, sale or use of explosives were issued. There were obtained 90 convictions for violations of the Federal explosives laws. A list of serious explosions in munition and powder plants that occurred during the war is given in the bulletin. The damage to property ran into millions of dollars.

Bulletin 198, "Regulation of explosives in the United States, with especial reference to the administration of the explosives act of October 6, 1917, by the Bureau of Mines," may be obtained by addressing the Director of the Bureau of Mines, Washington, D. C.

What a Cost System Does

THE Fabricated Production Department of the Chamber of Commerce of the United States is one of several service departments recently created to assist members in dealing with their problems. One of these problems is cost accounting, on which the department has recently sent out a bulletin from which the following is quoted:

Primarily, a business to exist must make money. This means that something must be disposed of for more than it has cost. Every manufacturer, therefore, is vitally concerned with the two items—cost and profit. The problems presented in labor, materials, production costs, and keen competition have made it necessary for a manufacturer to determine and constantly to know the cost of his product in order that his business may continue to be a profitable one, and earn the margin of profit desired. There is a definite dividing line between profit and loss, and the location of this dividing line can be and should be accurately determined.

Cost accounting is an accurate method for arriving at the cost of producing a complete and saleable commodity and delivering it to the carrier for transportation, reporting in usable records all the various elements which go to make up these costs. Records of costs are valuable in themselves, yet it is the detailed information which they contain, available for ready reference, which is of the most value. Accurate information regarding the various elements which go to make up costs, as contained in cost records, automatically eliminates arbitrary, empirical, or guess costs which prevail to a surprising degree among many manufacturers. The cost system, like an X-ray picture, brings to light imperfect internal conditions and suggests correction.

Among the many ways in which cost keeping is an aid to production are the following: It brings to light inefficiencies in system by calling to attention the cost of its operation and points out equipment that has become inadequate by showing an excessive cost of product coming therefrom; it points out employes who are below the standard required, and permits of performances being kept within certain limits by watching the accumulation of costs. Increased production depends largely upon the intimate knowledge the management has of all elements in their manufacturing operations which can only be supplied through an adequate cost system. It enables them to establish proper control and increase output as warranted by the cost record.

The Central Michigan Gravel Company has been organized at Lansing, Mich., and has taken over the affairs of the Burwell Gravel Company of that city. Of the $15,000 capital stock, $12,000 has been subscribed and $10,000 paid in. The interests of this company comprise practically the only noteworthy gravel deposits contiguous to the city of Lansing. They are operating with thoroughly up to date equipment, and are in position to handle any and all business. Claude C. Ludwig is president of the company; Elven T. Larson, vice president, and Harry E. Robinson, secretary-treasurer and acting manager.

The recently organized $50,000 Hamilton Gravel Company, Hamilton, Ohio, will soon commence construction of gravel bins and washrooms, to be located at the end of North Third street. They have a contract with the Miami Conservancy District for removing the gravel from the river bed, and then this gravel will be prepared for use. E. J. Frechtling, C. J. Parrish, Richard Radcliffe, Russell Reigart and W. P. Watson are the incorporators.

Resumption in East

Signs Point to Early Start at Good Construction Program

By Our Eastern Correspondent

SAND, gravel and crushed stone producers in the eastern district are making ready for spring operations. As the days go by, the indications point to a real resumption of work in the construction fields, and of a character to require considerable material in the stone and gravel industry. Housing work is taking on an important aspect, and with the recession in this line for the past few years, it seems likely that dwellings and homes will constitute the primary phase of operations during the coming season. Road construction, also, seems destined to go ahead in a big way, and different states, such as New York, New Jersey and Pennsylvania, are arranging large appropriations for this purpose.

In the Cow Bay districts of Long Island fair production has been underway in recent weeks, encouraged by the fine open winter season, and stocks on hand are now more than adequate to take care of present demands. The Raritan River section of New Jersey is also stocking up well in anticipation of spring and summer call, as are other sand and gravel producing districts in South Jersey. Pennsylvania producers are operating at the present time in a smaller way, excepting in the Pittsburgh territory.

Prices are maintaining well at recently quoted levels. There has been no change during the past month, nor is there any indication of lower figures in the immediate weeks at hand. Reduced call has not had the effect of reducing prices, and both producers and dealers are settled in the opinion that if a fair profit cannot be shown, sales are not to be desired. Sand and gravel are selling in the New York wholesale market at $1.25 and $3.00 a cubic yard, respectively; the first noted figure is a decline of 25 cents as compared with the beginning of the year, incidentally, is the same price for the material as at this time in 1920. Dealers are asking $2.50 a cubic yard for sand, delivered in Manhattan or Bronx boroughs, meeting the reduced prices from a $2.75 level as heretofore prevailing. The quotation for gravel covers both 1½ and ¾-inch material; dealers' prices are around $4.00 and $4.25 for delivered material.

Crushed stone holds at from $1.90 to $2.00 for 1½ inch material in carload lots wholesale, while ¾-inch stock is selling in the market at $2.15. Hydrated lime at the warehouse is being turned at $20.00 a ton for common stock, and $21.00 for finished lime. Dealers are selling finishing lime in standard 300-pound barrels at $5.00 per barrel; common lime in same size containers, is selling for $4.80 delivered; hydrate finishing lime in cloth bags is retailing at $29.00 a ton, with bag rebate of 20 cents. Portland cement is holding to the $3.10 level, without bags, as recently established, or $4.10 delivered, with bags. The price of cement in this section a year ago this time was $2.80 a barrel. Building stone shows no change in price levels, and is operating under a reduced call. Limestone ranges from $1.83 to $2.07 per cubic foot, and sandstone from $1.75 to $2.10, according to variety.

The Colonial Sand & Stone Co., Inc., 643 West Fiftieth street, New York, has arranged for the operation of its own sand properties at Glenwood, L. I. The company's sand bank is in the Cow Bay district, with fine location for production and shipment. Extensive operations are planned during the coming season.

Increasing activity has been the

rule in the Lehigh Valley cement district of Pennsylvania during the past few weeks, and the outlook is encouraging for additional operations at an early date. The plants are all low on reserves, and such demand as has prevailed since the first of the year has gone to bring stocks down to a very low point. The Lehigh-Portland Cement Co. is now operating four of its large mills in this section, including two at Ormrod, known as Mills A and F, and plants at Fogelsville and West Coplay, respectively. Mill D at Ormrod is still out of commission. The four mills are being run on full time with a good size working force. Alpha-Portland Cement Co. has production underway at its Mills No. 3 and No. 4 at Martin's Creek; the first noted plant was recently placed in service following extensive improvement work, as well as the installation of a new 5000 Kilowatt turbo-generator. The Atlas Portland Cement Co., is operating at a number of its local mills. Other companies are looking forward to early production, and the next month will see considerably greater cement manufacture in this region.

Producers of sand and gravel in the Pittsburgh, Pa., district have been making the most of the fine, spring-like weather, and good, sizable production has been going forward on an encouraging scale. The Keystone Sand & Supply Co., has been operating in the vicinity of Coraopolis, and its tow-boat, "Victory," has been making constant trips to this point, keeping tahe sand-digger busy. The company is furnishing considerable gravel for the Pittsburgh trade. The company has been hauling contractors' equipment and other apparatus to Millwood. The Rodgers Sand Co. has completed improvements in its tow-boat "Sweetcake," and will place the vessel in service promptly. The "Rival," of this company's fleet, has been very active with the digger at Ambridge, carrying large loads of gravel from this point to the Pittsburgh market. The J. K. Davison & Brother Sand Co. is making ready for spring operations and a number of vessels of its fleet are now being inspected. These will be placed in regular operation at an early date.

An important series of hearings have been underway at Harrisburg, Pa., before the Public Service Commission, dealing with the complaint of the Pennsylvania Sand & Gravel Producers' Association of "discriminatory and unlawful" freight rates in the Pittsburgh district. An early decision is expected. The case has caused unusual attention, as it will form the basis for what is expected to be an equitable rate adjustment in the interest of the producers.

The United States Building Materials Company, Chicago, Ill., has offered $2,000,000 to cover the bond issue on the stone quarries and sand and gravel deposits from which the Consumers Company and the Producers Material Company obtain their material. It is agreed by the latter two companies that they will assume the payment of the interest on these bonds, whether or not they use any of the material, which amounts to practically a guarantee of the bonds. It is possible that, with certain restrictions, this issue may be doubled. This will be a serial issue, since, due to the very nature of the business, the property of the company will constantly decrease. The amount of each serial due per year will be $200,000 for the next ten years. The price is par and interest.

The Delaware River Quarry & Construction Company, 21 Bridge Street, Lambertville, N. J., has plans in project for constructing a new stone quarry in the environs of Glen Moore, N. J., at an expenditure of about $100,000. A main crusher building and power house will make up the plant. The work is going on under the personal supervision of R. A. Montgomery, president, Lambertville.

Will Pass at Extra Session

Highway Bill Expected to Go Through Congress Soon

By Our Washington Correspondent

THE Senate failed to pass the bill providing for the expenditure by the Government of $100,000,000, through distribution among the states, for road building during the fiscal year beginning July 1, next, with the result that the bill, which had passed the House by a big majority, will have to be introduced at the extra session of Congress, which convenes April 11. No doubt exists among officials of the Department of Agriculture, the branch of the Government having disposition of this fund, but that the bill will pass and will become operative in time for the next fiscal year. Having no chance to get through the Senate as a separate measure because of the jam during the final days of the last session, Senator Swanson, of Virginia, made an effort to attach it to the Post-office Appropriation Bill, but the necessary two-thirds majority could not be obtained. A straight majority, however, was obtained, the vote being 43 to 33, which indicates that the bill, as a separate measure and on its own merits, will have no difficulty passing at the coming extra session.

Congress is virtually forced to pass a bill providing Federal aid for road bdilding. The demand for good roads from every part of the country is being felt by members of Congress and in official circles. It is stated that their will be no effort at the extra session, however, to extend the provisions of the pending bill beyond the next fiscal year, as now provided, but that the question of a five year program will be brought up and urged at the regular session next December. That the December session will seriously consider the proposed plan of a national system of interstate highways seems assured. This action was predicted by the Senate's refusal to approve the effort to attach the $100,000,000 bill to the Postoffice Appropriation Bill.

The House had voted this money without any restrictions other than now embraced in the Federal Aid Road Act, which, it is asserted in some quarters, had failed in various directions to satisfy many of its original adherents. While the Federal money in some states aided materially in accelerating state systems of inter-county roads, in other states the rich counties "matched" the dollars from the National Treasury, with the result that the poor counties were still left in the mud. The result of this situation is that two groups have arisen, on the one side the highway officials and on the other those generally who are interested in good roads. Neither of them seem to be fully in accord with the purposes of the bill now before Congress. Both are agreed that joint Federal and state money should be expended upon roads of interstate importance, but the highway officials refuse to insist upon such a provision or to support the Townsend bill, introduced by Senator Townsend, designed to create a Federal Highway Commission and establish a national highway system of main roads connecting the several states.

What is said to have caused some opposition, in and out of Congress, to the $100,000,000 appropriations was the fear that its unrestricted adoption would fasten the Federal aid method upon the country for an indefinite period. One member of the House did not hesitate to say that the accord of the Senate in the bill would do exactly this thing. Debated upon its merits, those who favor an interstate

system and a commission believe that Congress will adopt a comprehensive plan, for the undertaking has the approval of practically every organization interested in road building. Argument in favor of the $100,000,000 appropriation, as it appeared before the last session, centralized on the plea that forty-three state legislatures were in session, and that unless the Federal Government supplied additional money at once the road building program in many states would be retarded. Many Senators took the stand that as long as the bulk of the money from future appropriations remained in the Treasury, that the road building program of the country would not be seriously interfered with by delaying consideration of good roads until the next Congress convenes.

In this connection, it might be recalled that on March 1, last, according to the latest figures of the Bureau of Public Roads, of the Department of Agriculture, approximately $622,000,000 was known to be available for road and bridge construction and maintenance during the year 1921. Should pending legislation be passed by Congress and additional appropriations be made for Federal aid, this sum would be increased by the amount of the Federal appropriation. The approximate sums available to each state from local, state and Federal sources, on the above date, were:

Alabama, $9,000,000; Arizona, $8,000,000; Arkansas, $12,000,000; California, $26,000,000; Colorado, $7,000,000; Connecticut, $8,000,000; Delaware, $3,500,000; Florida, $7,725,000; Georgia, $10,000,000; Idaho, $4,500,000; Illinois, $20,000,000; Indiana, $9,500,00; Iowa, $37,000,000; Kansas, $20,000,000; Kentucky, $8,000,000; Louisiana, $6,000,000; Maine, $7,500,000; Maryland, $4,800,000; Massachusetts, $8,000,000; Michigan, $20,000,000; Minnesota, $20,000,000; Mississippi, $11,000,000; Missouri, $15,000,000; Montana, $8,500,000; Nebraska, $6,000,000; Nevada, $3,.00,000; New Hampshire, $2,500,000; New Jersey, $16,000,000; New Mexico, $4,000,000; New York, $55,000,000; North Carolina, $6,500,000; North Dakota, $7,000,000; Ohio, $35,000,000; Oklahoma, $8,000,000; Oregon, $10,000,000; Pennsylvania, $30,000,000; Rhode Island, $1,700,000; South Carolina, $6,000,000; South Dakota, $7,000,000; Tennessee, $10,275,000; Texas, $60,000,000; Utah, $6,000,000; Vermont, $2,000,000; Virginia, $10,000,000; Washington, $14,000,000; West Virginia, $8,000,000; Wisconsin, $19,500,000; Wyoming, $3,000,000.

Further argument for good roads, and one of the things which is making the demand more insistent, is the great number of automobiles in the country. Many commercial cars are being used to transport farm products, not to speak of sand, stone and gravel for short distances, to the towns and cities. In connection with a study of revenue available for road building, the Bureau of Public Roads has just compiled figures showing that there were a total of 9,211,295 motor cars, including commercial vehicles, registered last year in the forty-eight states and the District of Columbia. There were also registered a total of 238,146 motorcycles. The registration and license fee, including those for chauffers, operators and dealers, amounted to $102,034,106.26, according to the bureau. As compared with 1919, the data for 1920 represents an increase of 22 per cent, or 1,645,849 motor cars.

In 1920 in the state of New York alone, the number of motor cars registered, including commercial vehicles, exceeded the total cars registered in the whole of the United States in 1910. Furthermore, the revenue derived from registration in the state of New York in 1920 was about equal to the entire registration revenue of the country in 1913.

The use made of revenues has changed with passing years. For a number of years the general tendency toward devoting an ever-increasing portion of the motor vehicle revenues to road work under the control and direct supervision of the state highway department has been very noticeable. Prior to 1912 only a very small portion of the motor vehicle registration was devoted to this purpose. In 1920, according to the bureau, 76 per cent of the revenue, or $77,531,582.57, was applied to road work under the direct supervision of the state highway departments and in addition $20,465,578.04 was applied to road work by counties or other local supervision, but with little or no direct supervision from the state highway departments.

In most states the motor vehicle revenues are devoted to maintenance and repair of the state roads or other improved highways, continues the bureau. These states seemed to have solved fairly well the difficult problems of securing funds for the maintenance of the more important roads under the ever-increasing traffic requirements. As both the traffic and the revenues increased with the number of cars, there apparently exists a possibility of adjusting the registration rates so as to keep pace with the ever-growing maintenance changes. A number of states having in general but a small mileage of improved roads have recently adopted the plan of capitalizing the motor vehicle revenues and devoting these funds to road construction. In them bonds have been voted or issued for road construction, and the principal, in some instances also the interest, is to be paid entirely from the motor vehicles revenues.

At the beginning of 1921 there were still seven states in which motor trucks were registered at the same rate as passenger cars, but in recent years there has been a very decided tendency in most states to increase the fees required for motor trucks over and above those required for passenger cars. This increase is usually based on the weight of the truck and its carrying capacity, its horsepower, or a combination of these factors. The most general practice seems to be toward definitely limiting the maximum total road weight of the vehicle and basing the registration fee on the capacity of the truck. Some few states have adopted a scale of fees, which in actual practice, serves to make the operation of a very heavy truck impracticable.

Although sand, gravel and stone producers may have difficulty in procuring cars later on, it is estimated that there are now more than 300,000 open top cars lying idle. It is anticipated that the movement of these products will grow heavy in about a month, and as the spring movement of coal will start about the same time, the movement of all of these products continuing through the summer months, the Interstate Commerce Commission anticipates that there may be a shortage of open top cars in the next sixty to ninety days. It is estimated that the new cars purchased during the last three or four years will not equal the number of similar cars put out of the service. Just at present, however, there is a surplus of this kind of car, reports from the commission show.

The Oliver Silica Sand Company plant at Warwick, Ohio, was completely destroyed by fire in the early morning hours on March 1. There is an estimated loss of $75,000, part of which is said to be covered by insurance. The officials of the company stated that the cause of the fire is still unknown.

The Mentzer-Romberger Company, Harrisburg, Pa., handling stone products, are preparing to surrender the company's state charter, owing to dissolution of the firm. There are no liabilities.

News from the Coast

Signs of Considerable Activity Around San Francisco

By Our San Francisco Correspondent

ALTHOUGH a normal amount of business is being done by Pacific coast sand, rock and gravel concerns, the usual winter dullness is being felt to a considerable extent this season. However, prominent members of the industry are more than hopeful concerning the immediate future and an optimistic feeling prevails.

Contemplated road and highway construction is holding the largest share of attention and despite some procrastination on the part of officials in getting construction plans under way, business will be good, it is thought. Building, particularly of large office buildings and other large structures, is on in full swing in San Francisco and other towns throughout the northern part of the state.

That California may lose $10,000,000 in Federal aid for highway construction unless the state highway commission constructs roads of greater thickness, is the startling statement of C. H. Sweetser, district engineer of the bureau of public roads, United States department of agriculture. Road construction in future must be of a more permanent character than at present, he says in a letter to Ben Blow, good roads manager of the California State Automobile Association.

Prior to a recent investigation made by the two automobile clubs of the state, $50,000,000 was spent in constructing roads of four-inch thickness. It has now been decided by the Federal authorities, Sweetser says, to require a thickness of six inches of concrete pavement on a satisfactory subgrade, with provision for increasing this thickness to eight inches where there is a question of poor subgrade or drainage. Five-inch pavements now planned by the state highway commission are inadequate, according to Sweetser.

Suits against the Coast Rock and Gravel Co., the Niles Sand and Gravel Co., and the California Building Materials Co., by the Alameda county board of supervisors, for gravel operations near the Niles bridge, which is said to be endangered by the operations, have been compromised. The companies have agreed to discontinue operations until the creek bed has been refilled to its former level. After this it is agreed not to remove the sand below a level specified in the injunction proceedings.

Grading and surfacing a little more than four miles of the highway extending from a point near the Sacramento river levee to a point opposite the river bridge at Grand Island, south of Courtland, has been awarded to the Healy-Tibbitts Construction Co. of San Francisco.

Establishment of a million-dollar state-owned cement plant is proposed in the state legislature in a bill offered by Senator J. H. Inman. The plant would be authorized to sell cement to cities and towns.

It will probably be four years before all roads planned under the recently voted $40,000,000 bond issue can be constructed according to officials of the state highway commission. "It is evident that this bond issue will not do the work mapped out for it" the commission's report avers.

Quarry possibilities in Riverside county for the production of rock and gravel are practically unlimited, according to a report prepared by local interests there. Quarries in Temascal canyon with the Temascal Rock Company's crushing have great possibilities, the report states. Crushed rock is being produced there at full blast. The material is a rhyolitic porphory, very hard and sharp.

Trade Good in Kentucky

Winter Stocks Are Cleared Out and Promise of Early Demand for More Materials

By Our Louisville Correspondent

AFTER making the rounds and canvassing the trade in Louisville and the surrounding territory and reading about what is going on in other parts of the country, the inevitable conclusion is that trade and trade conditions are good in the Kentucky territory in practically all lines, including those of crushed stone and sand and gravel. Louisville is probably better off in the matter of prospective work ahead and in road construction and has made more progress already than most other sections of the country. There are a number of big road projects getting under way out in the state, while in the city proper building permits and building operations have already set a lively pace in view of the general hesitancy the country over about building. This is due in some measure to the fact that during the war period Louisville had no boom, therefore had no reaction. At the present the city is taking on a natural growth and expansion both in industrial and in residence buildings, and there is an air of cheerful prosperity which probably cannot be duplicated in any other city of its size in the country.

One finds evidence of this reflected in the big river sand and gravel yards where in some cases the winter demand has practically cleaned out all the stock on hand and where they are busy now getting the digging equipment in action and starting up for the busy summer run.

Captain E. T. Slider said they have spent most of the winter pottering around with their equipment and spending lots of money keeping the crew together and making repairs, but he feels that the situation will clear up soon and we will be getting along all right before the year is over. They expect to start their digger out about the first of April. Meantime they have had enough stock in their yards to take care of current needs, which have been fair to medium.

The Ohio River Sand Co. had cleaned its yard stock down to practically bare boards and had to start one of its diggers early in March, the small one; the larger one started later in the month. The river has been pretty high, but at this writing it is going down some, and anyway they had to get busy with the diggers because they have cleaned down the yard stocks. There has been no special rush that did this, but just a normal run of business which has been of good enough volume to keep things moving and to clean out all the large storage room and make necessary the starting of the diggers to work a little earlier this year.

There has been a little voluntary downward revision in sand and gravel prices in starting off the season. The present yard prices are $1.30 a cubic yard for sand and $1.40 for gravel, which represents a reduction of 5 cents a yard. Delivered prices range from $1.75 and $1.90 up to $2.75 and $2.90, depending upon distance.

The established summer price for carlot business is as follows f. o. b. cars:

Sand per ton	$1.00
Concrete gravel (¼ to ½-inch)	.90
One-inch gravel	1.15
Roofing (¼ to ½-in.)	1.25

The indications are that between the local demand for building purposes and the good roads projects out in the state there will be a goodly volume of business in sand and gravel and the local operators in the river sand and gravel business will be kept busy.

There are quite a number of good roads plans under way which give

promise of busy times among the quarries and also there are a number of street and alley projects contemplated in the city which will include the innovation of building alleys of concrete and this will naturally call for sand and gravel.

On the 15th the State Highway Commission at Frankfort let road contracts totaling over $640,000, the largest of which, for $469,000, went to the R. B. Tyler Co., of Louisville. This is a contract for eleven miles of the Jackson Highway in Barren County, running from Glasgow north, which is to be finished off with Kentucky rock asphalt.

Cornell & Brecht, of Williamstown, secured a contract for four miles of concrete roadway between Williamstown and Dry Ridge on the Dixie Highway in Grant County.

These are examples of contracts already let and there are many other projects being worked out.

There is some assurance from H. Green Garrett, Winchester, chairman of the State Highway Commission, that the Louisville-Cincinnati Highway project, which was first disapproved by the United States engineer, has been saved from the discard and has now been approved and work will start this spring.

The Kentucky Association of Highway Contractors, recently organized in Louisville, has now been incorporated. The declared purpose is to promote road building and establish better relations between the State Highway Commission and the Highway Engineers, the fiscal courts in Kentucky and the contractors for highways. The incorporators are Henry Bickel, J. H. Cahill and George M. Eady.

The R. B. Tyler quarry and crushing plant at Tuckers Station, near Louisville, which was forced to close down early last winter because of car shortage, is to be started up the first of April if nothing goes amiss, because that is what they are working toward at this writing, and they are hoping for a busy season and steady run.

From the foregoing, and when we take into consideration the fact that building permits issued so far this year are ahead of last year and compare well with our best building years, it will be seen that the trade prospects in Louisville are very encouraging in view of the fact that industry and building operations have been hesitating almost everywhere. The indications are that the hesitation is over with here and labor and wage conditions and costs generally are more favorable than reports indicate they are in other cities. Consequently it looks like full time ahead and good business all around for the sand and gravel and quarry people.

From time to time considerable interest has centered on what is called the New Albany shale, a thick deposit in this territory carrying a percentage of oil. It is now reported that the Autocar Co., of Philadelphia, is behind a project to construct a $200,000 experimental plant for the distillation of oil from shale. The plant is to be located between New Albany and Jeffersonville, Ind., and will not only add to local industries but will furnish a real test of the oil shale possibilities of this section of the country.

Following a vote taken at a meeting of the stockholders of the Agricultural & Commercial Lime Company, North Industry, Ohio, dissolution of the corporation was effected by surrendering its charter to the state. This company was organized in 1910 and the plant was in operation until the winter of 1919, when they sustained a severe loss by fire, whereupon the property was sold several months ago to August Heiman of Massillon. Harter & Harter acted as the company's agents in the transaction.

The Hendrick Manufacturing Company, Carbondale, Pa., has opened a Pittsburgh office, 915-916 Union Bank Building.

Twelve Types of Surfacing on Lincoln Highway

It is 3,305 miles from 42nd street and Broadway, New York, to the Golden Gate, overlooking the Pacific, via the Lincoln Highway. Over this great road, which cuts through the heart of the Union, are to be found the various classifications of road types and road construction most familiar to the American public.

Usually, the first question of the individual making inquiry concerning the condition of the Lincoln Highway is, "What is the road like today?" The answer is given in the figures just made public by the Lincoln Highway Association, contained in the following table:

End of	Mileage	Improved
1913	3,389	1,598 miles
1918	3,323	2,161 miles
1919	3,323	2,421 miles
1920	3,305	2,853 miles

That the Lincoln Highway Association is doing wonders in the way of bringing about the actual improvement of the transcontinental route is well indicated by the following table showing improvements to date:

Classification of types of road construction on the transcontinental route, New York to San Francisco, January 1, 1921:

Concrete	422.34 miles
Brick	219.68 miles
Bit. macadam	401.81 miles
Macadam	287.10 miles
Asphalt	78.00 miles
Creosote block	5.90 miles
Granite block	7.10 miles
Graded gravel	956.00 miles
Natural gravel	62.10 miles
Graded earth	725.67 miles
Natural earth	136.00 miles
Sand	3.30 miles
	3,305.00 miles

In seven years' time a total of $31,284,520.00 has been spent in the improvement of the Lincoln Highway. In 1920 alone, new construction accomplished on the highway ran as follows:

Concrete	127.5 miles
Brick	7.1 miles
Bit. macadam	12.2 miles
Macadam	.5 miles
Gravel	187.8 miles
Permanent earth grade	206.9 miles
	542.0 miles

According to present plans, the Lincoln Highway Association anticipates further improvement in the coming year at a cost of approximately $10,000,000.

In the Lincoln Highway, the United States is getting what the originators of the project set out to obtain—"the establishment of a continuous, improved highway from the Atlantic to the Pacific, open to lawful traffic of all descriptions."

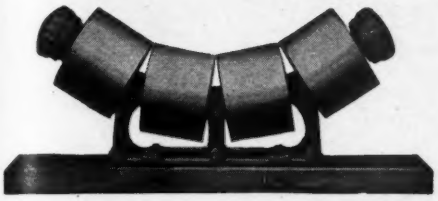
Dangers in Using Low-Grade Foreign Detonators

It has been recently learned as reported by the Bureau of Mines, that certain foreign manufacturers are offering for importation into this country detonators at greatly reduced prices, some of these detonators being of such low grade that their use would greatly increase the dangers in blasting.

Study of the subject has made it evident that it is good practice to employ in all instances and with all high explosives a high-grade detonator, even though the explosive is normally sensitive to lower grade detonators. It was found that many explosives, even dynamite, which are sensitive when newly made become progressively less sensitive with time; that in many instances an explosive in the bore hole becomes less sensitive because of wetness of the bore hole and other causes, such as hard pressing while tamping; besides, unless extreme care is practiced in charging the priming cartridge containing the detonator into the hole, the detonator might be wholly or partly pulled out of the cartridge so as to leave an intervening space between the detonator and explosive charge. Obviously, under these circumstances, a high-grade detonator is much more likely to fire the shot than a weaker detonator would, thus greatly reducing the chances of a misfire, delayed shot, imperfect explosion, or simple ignition.

Organization of the Lehigh Slag Company, Alburtis, Pa., is announced. They will deal in slag, crushed stone and kindred products. Capitalization $30,000. A. F. Kostonbader, Catasauqua, Pa., is incorporator.

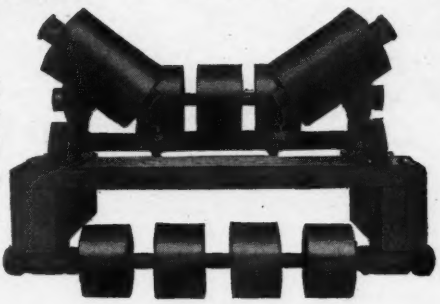
CALDWELL CONVEYORS

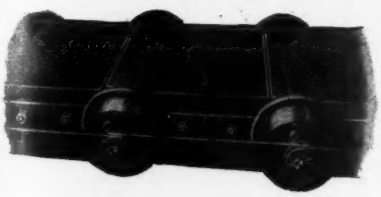


BELT CONVEYORS

Simple in design, economical of power, they give satisfaction. Different styles to suit your requirements.

A rough sketch showing conditions to be met at your plant, with capacity desired and power available, will bring our recommendations.





APRON OR PAN CONVEYORS

Flights or pans made of steel or cast iron, fitted to steel bushed self-oiling roller chain — complete with drives.

SCREW CONVEYORS

Steel "HELICOID" or Sectional flight screw conveyor for washing plants. We also make cast iron Screw Conveyors.

See Catalogue No. 38 for complete line of

Elevating, Conveying and Power Transmitting Machinery

H. W. CALDWELL & SON COMPANY
CHICAGO
Western Avenue, 17th and 18th Streets

Loading trucks in a Wisconsin Gravel Pit.

Hand or Machine Loading

It takes two men approximately 30 to 40 minutes to load 5 yards of sand under the muscle-and-shovel method of loading.

The same number of men, working for the Milwaukee Sand & Gravel Co. in Milwaukee, in conjunction with a portable belt conveyor (the "Porta-belt," manufactured by the Brown Portable Conveying Machinery Co. of Chicago), load 5-yard trucks, according to the user's own statement, "in from 5 to 7 minutes." In other words, no less than 80 per cent of all the labor, time and expense of loading is dispensed with by the use of the machine.

This, it was found, was not all. Shorter loading time naturally results in shorter periods of idleness for the wagons and trucks. That, in turn, means greater returns on the delivery equipment investment.

How great this feature of the proposition is may be gauged from the fact that statistics recently compiled by a user of trucks places the estimate of the fixed overhead expense of every truck—regardless of whether it is idle while being loaded, or on the move—at $1.00 an hour, figured as follows:

Driver's salary	$6.35
Interest on investment (per day)	.72
License, cost per day	.15
Insurance cost, per day	.80
	$8.02
Figuring 8 hours a day, each hour	$1.00

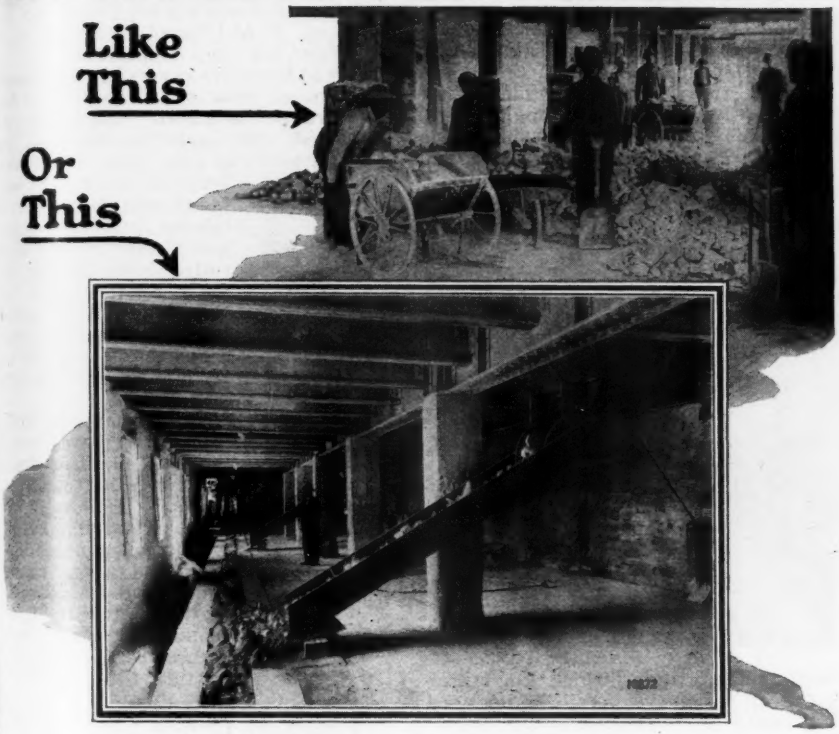
When this amount is considered, and when it is further considered that under hand methods every truck load of material delivered entails a waste of 45 minutes of potential truck earnings, because of the time required for loading by hand, the enthusiasm of certain pit men over mechanical loaders is not difficult to understand.

The mechanical loader releases wagons and trucks in less than 10 minutes after they arrive at the pit or yard. It not only prevents the loss of the expensive overhead cost of the truck, but it causes wagons and trucks to earn more by enabling them to make more deliveries per day.

How Do You Handle Lime?

Like This →

Or This →



Above—the old-fashioned system of drawing the kilns by hand, piling the lime on the floor, and carting to crushers or cars in wheelbarrows.

Below—the modern and up-to-date Link-Belt method (part of our equipment furnished the Riverton Lime Co., Riverton, Va.), where the lime is handled by machinery from the kilns to overhead storage bins, and thence to shaker screen, which delivers to crusher, box car loader, or barrels, all with a minimum of labor, expense and increased output.

Let our engineers suggest a layout for your plant.

LINK-BELT COMPANY

CHICAGO—300 W. 39TH STREET
PHILADELPHIA—HUNTING PARK AVE. AND P. & R. RY.

LINK-BELT

New Crawling Tread Machine

One of the latest designs of crawling tread cranes developed is the new O. S. Dependable manufactured and sold by the Orton and Steinbrenner Co. of Chicago and Huntington, Ind. The same standards and specifications as regards quality of material and workmanship under which the larger types of locomotive rail cranes are fabricated are embodied in this crawling tread machine. In fact the superstructure of it is proportionately identical with that used by the Orton & Steinbrenner Co. in their heavier and larger capacity standard gauge rail types.

Two sizes of cranes are made in the new design, rated as 7 tons and 12 tons capacity.

The details of construction are very simple and rugged. The crawling tread is developed from and an improved form of that used on Government tanks during the European war. The tread links and sprockets are of cast steel of ample size and the chain idler rollers are bronze bushed with patented pressure system of lubrication. Each crawling tread is supported on bottom between drive sprocket and idler by four pairs of idler rollers. Each pair of idler rollers is carried in equalizing strut backed by heavy coil spring and when traveling over obstacles such as rails, road tracks, etc., rollers will tilt as much as 6 inches from the horizontal. This device equalizes pressure of crane on ground and enables it to travel over the roughest surfaces while yet maintaining constant compression on springs. It will travel up grades of 20 to 30 per cent in soft material.

Tread links are reversible and crane can travel with equal facility either forward or backward. Links are so designed that ends overlap and no foreign material can enter the spaces between. Crawling tread is adjustable by screw takeup and by single pair of idler rollers with coiled steel springs on top. Surface area of crawling tread is great enough to reduce unit pressure on ground to 10 pounds per square inch.

The sprocket is driven by steel bevel gears and steel shafting from a countershaft of the hoist.

Booklet giving a full description and illustration of above crane can be had by addressing the Orton & Steinbrenner Co. at their main office, 608 S. Dearborn St., Chicago, Ill.

Chicago Office Opened

The Buffalo-Springfield Roller Company, of Springfield, Ohio, manufacturers of the Kelly-Springfield and Buffalo-Pitts road rollers, both steam and gasoline, have opened offices in Chicago with Mr. E. H. Edwards in charge.

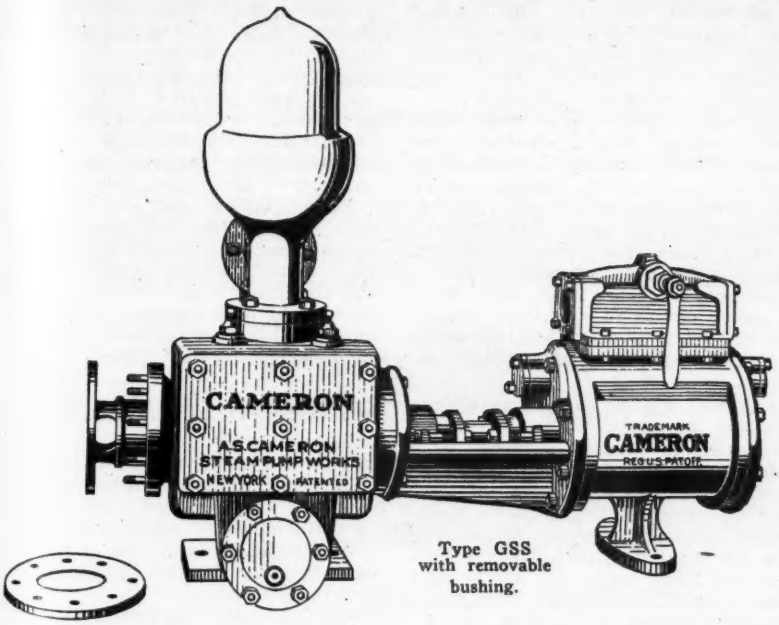
Mr. Edwards will have his headquarters at 975 Old Colony Building, Van Buren and Dearborn streets, and will look after the company's important Chicago interests from this point.

The opening of this office will enable the Buffalo-Springfield Roller Company to serve the interests of its many satisfied customers in this territory.

Mr. Edwards has been in the machinery business for a good many years at 975 Old Colony Building and is thoroughly posted on the merit and efficiency of Buffalo-Springfield Rollers.

Estill Springs Sand & Gravel Company, Louisville, Ky., $10,000, is a new company.

CAMERON PUMPS



Type GSS with removable bushing.

A pump which successfully operates under the conditions imposed by general contracting must be sturdy, reliable and economical. Sand, gravel and rubbish of all sorts must be pumped along with water.

The Cameron Direct-Acting Pump has made good in the quarry service as it has in every other field of industry.

Simplicity of Operation—There are only **four** moving parts in the steam mechanism.

Ready accessibility—The removal of **nine** nuts permits a thorough inspection of the waterend.

These are the main factors responsible for what has come to be known as Cameron Reliability.

Ingersoll-Rand Company

A. S. Cameron Steam Pump Works 105-S

11 Broadway, New York

Ingersoll-Rand

New Remedy for Boiler Scale

The Scientific Boiler Chemical Works is the name of a firm which has placed on the market, Konkerall, a scale remover and preventive, which is claimed to be unlike any thing else and based on an entirely different and scientifically correct principle.

It is not in any sense a "boiler compound," as the term is commonly accepted. Konkerall simply makes ineffective the binding element of all scale forming matter, making the formation of scale impossible. While steam is being generated, the foreign element is precipitated and carried in suspension by Konkerall, and when the boiler comes to rest, this precipitate will settle as a soft sludge, which can readily be blown off through the blow-off valve.

Konkerall will not only prevent the formation of scale, but will remove that which is already formed, in a gradual manner and without injury to boiler.

Several people witnessed a very convincing demonstration of the claims made for Konkerall recently. A test-tube was filled with city water and heated to the boiling point. Then one drop of Konkerall was added, and almost immediately a peculiar soft, feathery substance formed in the water. The water was then allowed to cool, and this substance gradually settled in the bottom of the tube.

The test was then repeated, using distilled water, in which, of course, there is no foreign matter. The water was heated, Konkerall added, but the former reaction did not take place, there being no formation of foreign matter whatever, proving conclusively that substance formed in the first test, was not a result of adding Konkerall, but was the effect of Konkerall on the scale forming element in the water.

The remarkable feature of Konkerall, is the small amount required to gain the desired effect, only three pints being necessary to treat 5,000 gallons of water.

The company is arranging to send samples of Konkerall to interested parties, making it possible for them to conduct the experiment themselves, and to their entire satisfaction.

The Jersey City Stone Works, Monmouth Street, Jersey City, N. J., is adding to its material handling facilities by erecting a new shed at its plant.

Locomotive Approved

The United States Bureau of Mines has issued the first approval for a storage battery locomotive for use in gaseous mines to the George D. Whitcomb Co. of Rochelle, Ill. The approval, dated March 14, covers a six-ton storage battery locomotive. As approved, the Bureau of Mines recommends this locomotive for service in gaseous mines and considers it much safer than the types heretofore used.

Each approved equipment will have an approval plate attached to the controller bearing the seal of the Department of the Interior, Bureau of Mines, and including a caution statement that should aid both company and state inspectors in keeping these locomotives in a permissible condition.

New Sales Managers

Robert C. Weller has been appointed general sales manager of the Lakewood Engineering Company with headquarters at Cleveland. Mr. Weller is in full charge of sales work.

Carlton R. Dodge is the new western sales manager of the Lakewood Engineering Company, with headquarters at 1215 Lumber Exchange Bldg., Chicago.

Change of Name

The firm name of the John F. Byers Machine Company, Ravenna, Ohio, has been officially changed to the Byers Machine Company and will so appear henceforth.

The Belmont Sand & Gravel Company, a new corporation, capitalized at $150,000, will build a $75,000 plant near Belmont, Mich., for the production of road and building gravel, and also special gravel for roofing purposes. The company will number among its stockholders several contractors and builders of Grand Rapids and western Michigan. The temporary officers are the following: President, Maurice Sluyter; vice-president and general manager, Isaac R. Blandford; secretary and treasurer, Henry Van Aalderen. The directorate is composed of the above named officers and D. W. Kimball and Fred R. Raymond. Most of the stock has already been subscribed, and a downtown office has been established, while work on the plant will be pushed, so as to be in full operation by July 1, 1921.